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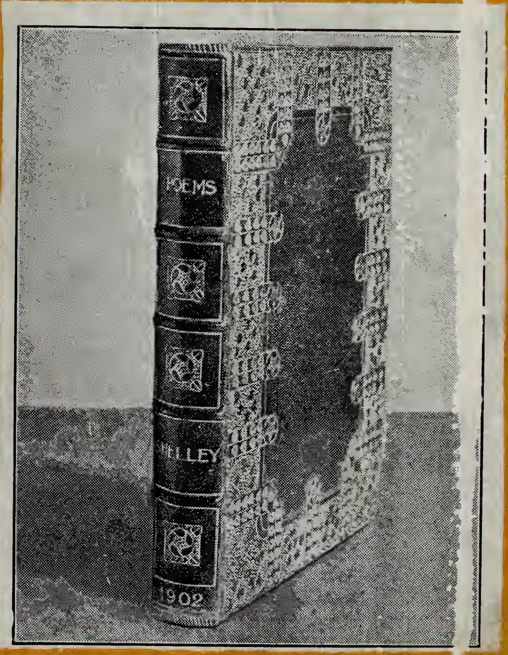

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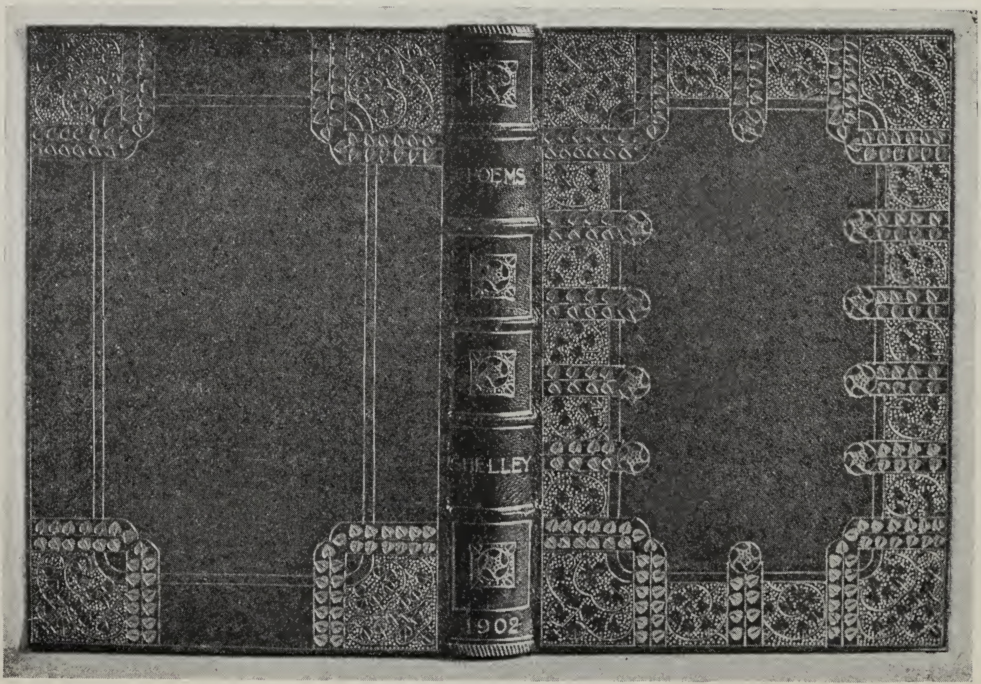

*Frontispiece.*] Fig. 78.—Specimen of Bookbinding in Levant.
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# PRACTICAL
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# PREFACE.

Probably you, good reader, have often experienced a thrill of pleasant satisfaction on taking up and handling a well-bound book. If so, the practice of the Art of Bookbinding will no doubt be a fascinating study for you.

As a lover of good binding, I venture to hope that this small volume may be serviceable and of practical assistance to you.

Originality is not claimed for the matter herein contained, but I trust that it has been arranged in such a form as to be easily understood by those who favour me with a perusal of the following pages.

The aim throughout the book has been to present the instructions in such a way as to make them of special service to *beginners*, whose many difficulties and failures I have gone through. With this knowledge and with the practical experience derived from many years of teaching, I feel confident that if beginners will only carefully read through these pages and follow the methods given, combining

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the same with continual practice, they will be able to steer through the shoals of difficulties which in the Art of Bookbinding, as in other crafts, are to be met with, and which must be cleared before skilful workmanship can be attained.

With the advancement of technical education, many art and craft classes have been started, and probably others will be opened throughout the country, until every town and village is provided with the means of obtaining practical instruction in the different crafts; for all must admit that, although in craft work much can be taught through books, it is always advisable that those who are anxious to perfect themselves should join a class where practical instruction can be obtained. I urge this, as many apparently insurmountable difficulties are cleared away, when the pupil has an opportunity of seeing the different processes executed by a skilled worker. It is, therefore, with the idea of helping, more particularly, those who are debarred from the privileges and assistance of such practical classes, that the various photographs from life of the many intricate manipulations have been taken. To the more advanced workers I also trust that many of the hints may prove of use.

The City and Guilds of London Institute has given much help towards advancing the Art of Bookbinding, by the institution of public examinations for those who desire to follow this branch of work. Under the Institute's patronage many classes have been arranged, wherein an opportunity is given to the students of becoming not only skilful binders, but artists in their profession; and in this respect the work done by the County Councils must also not be forgotten.

To those who wish for more extended and detailed information: "The Art of Bookbinding," by Joseph W. Zaehnsdorf, and "Bookbinding and the Care of Books," by Douglas Cockerel are recommended—both works being of the most practical value to any one studying this craft. They are without doubt the best books on this subject at present on the market, and should find a place on the shelves of every lover of books.

In conclusion, I would remind the reader that these pages have been written with the intention of appealing not only to those who are intending to pursue this craft for financial gain, but also to those who intend following bookbinding with the object of obtaining pleasure from their work, and from a desire to become possessed of well-bound books. If, then, by means of this small book more workers may be induced to join the ranks of true craftsmanship, my efforts will not have been in vain.

I desire to place on record my indebtedness to Miss B. A. Lucking, teacher of bookbinding to the Middlesex County Council, for the assistance she has rendered in the preparation of the subject matter, and without whose help this book would not have been written.

To Mr. J. Livsey, for his kindness and help in revising and correcting the proof sheets, I beg to tender my sincere thanks.

William Bonner Pearce.

Bedford Park,
London, W.

# PRACTICAL BOOKBINDING.

## CHAPTER I.

### Preliminary Operations.

Books leave the hands of the printer in the form of sheets, the text of the book and the illustrations being arranged in masses. These afterwards form the pages, which are interspersed with blank spaces of paper for the margins.

Sheets of paper for printing are made in various sizes, and are known by technical terms, according to their measurement in English inches. Among the many which were, or are, made, the following may be mentioned :—

| | | | |
|---|---|---|---|
| Post | measuring | in inches | 19½ × 15½ |
| Demy | ,, | ,, | 22½ × 17½ |
| Medium | ,, | ,, | 24 × 19 |
| Royal | ,, | ,, | 25 × 20 |
| Super Royal | ,, | ,, | 27½ × 20½ |
| Imperial | ,, | ,, | 30 × 22 |
| Double Foolscap | ,, | ,, | 27 × 17 |
| Double Crown | ,, | ,, | 30 × 20 |
| Sheet and Half Post | ,, | ,, | 23½ × 19½ |
| Double Post | ,, | ,, | 31¼ × 19¾ |
| Double Demy | ,, | ,, | 35 × 22 |
| Double Royal | ,, | ,, | 40 × 25½ |

The first process which the binder is called upon to perform is folding, *i.e.*, folding the printed sheets in such a manner that when the edges are cut, each sheet will form one *section* of the book. As will be seen from a reference to the foregoing list of printing papers, books vary in size according to the paper used; but the size of the book is again regulated by the number of times the particular sheet is folded. This, of course, is arranged for by the printer when spacing out the text, etc., into the aforementioned masses.

The following technical expressions are used to denote the number of leaves into which the sheet has been folded.

*Folio*—the sheet is folded once, making two leaves to the section.

*Quarto*—the sheet is folded twice, making four leaves to the section.

*Octavo*—the sheet is folded three times, making eight leaves to the section.

*Sextodecimo* — the sheet is folded four times, making sixteen leaves to the section.

The three latter expressions are usually abbreviated as follow :—Quarto = 4to ; octavo = 8vo ; sextodecimo = 16mo.

In order to explain more clearly this folding, we will assume that a sheet of demy paper, measuring 22½ ins. by 17½ ins., has been folded once. This will be termed demy folio, and will thus produce a section consisting of two leaves, *i.e.*, four pages, and measuring approximately, when in book form and cut, 11 ins. by 17 ins. If the sheet were folded twice it would be demy quarto, and a section would consist of four leaves, or eight pages; and so on.

Folding is not a difficult operation, but it must be done with care, and vigilance must be exercised in order to keep each page in register, so that when the book has been *collated* the headlines (if any), or the edges of the printed matter, will all stand over each other quite vertically. The method usually adopted in folding is to place the flat sheet upon a board or table, and to fold it towards the worker. The upper part of the sheet should be turned over *towards* the worker, and the joint should be creased or flattened with either a bone folder or a flat strip of wood. This will then be a folio. If it is to be folded again into quarto, the worker should fold over from right to left, or *vice versa*. Before creasing or flattening too much, it is advisable to hold up the sheet to the light in order to ascertain whether the headlines and printed matter are actually in register on each of the pages. Thus, if the sheet be folded twice or more it becomes a *section*; but if in folio and folded once, it is usual to arrange for two or more sheets to form the *section*. This is done by placing one within the other after folding.

Probably the beginner may experience some difficulty in obtaining from the printer, or publisher, a book in sheets, as generally they do not care to supply sheet copies for one book only. Therefore, we suggest that, instead of procuring freshly-printed sheets, the first attempt at binding should be made with a book that requires re-binding, or with some periodical or book which has been issued in parts. In re-binding it will be necessary to carefully remove the back or cover, and to cut and pull out the old sewing thread. Thought and care must be exercised in order not to damage the leaves or to cut the sections. The latter are usually published unsewn, and are merely protected by a paper cover. In any case it is almost certain that a coating of glue has been put on the back, and this, of course, must be removed in the manner explained hereafter.

In order to prevent disappointment and to ensure success, it is advisable for beginners to make their early attempts at binding upon a small rather than a large book. For this purpose the size should not exceed 7½ ins. long, 5 ins. wide, and the total thickness should not be more than 1 in.

After stripping off the outside cover, remove any pages of advertisements that are printed on separate sheets from the leaves of the book itself. The novice is advised to note that in many modern publications there is a tendency among publishers to so arrange the advertisements on the sheets that, in binding, these sheets must either be included in the book or cut into two parts. If the latter method be resorted to, it is necessary to *guard* the divided sheets in the way described in the next chapter. It may be convenient here to explain the following technical expressions used to denote parts of the book.

*Back*—the outside of the folded section, or where the name of the book is lettered in after covering.

*Head*—the top of the sections.

*Tail*—the bottom of the sections.

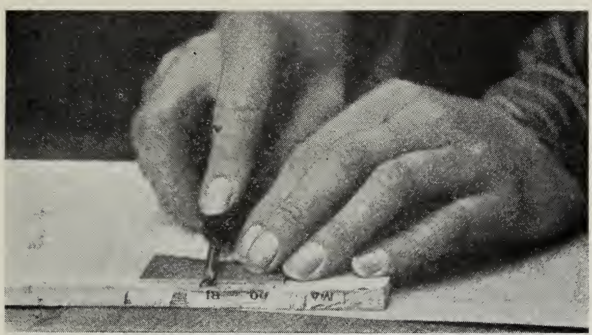


Fig. 1.

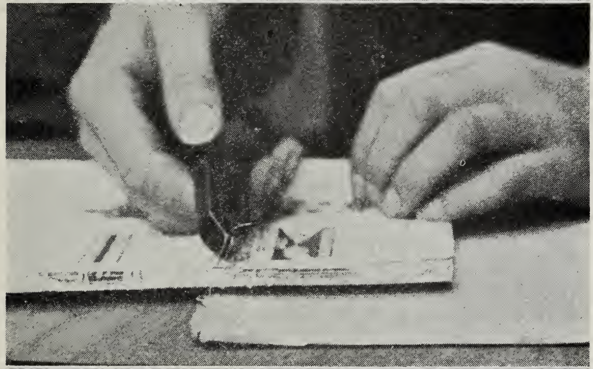


Fig. 2.

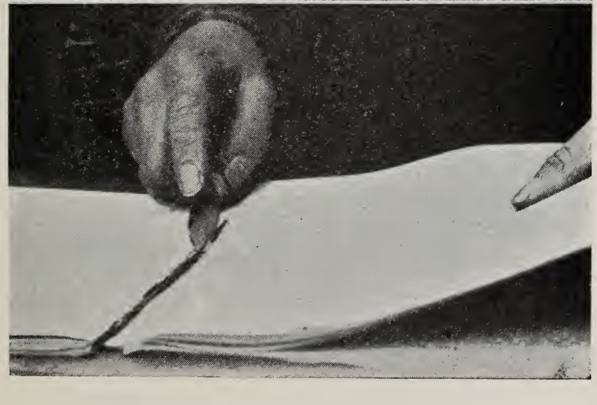


Fig. 3.

*Fore-edge*—the front edge of the sections parallel with the back.

*Sides*—the parts where the boards are placed: the front being called the obverse side, and the under side the reverse.

In addition to a coating of glue having been given to the back of periodicals, it is possible that the sections may also be held together by wire staples. It will be found that these staples have been driven right through the pages near to the back; and before attempting to pull the sections apart, the staples should be carefully removed, in order that the pages may be damaged as little as possible. Proceed in the following method:—Find the ends of the wire, and lift them up by using an ordinary bradawl or small screwdriver. A small piece of flat metal is useful to form a rest for the tool, when one is levering open the ends of the wire (see Fig. 1). This operation is accomplished much in the same manner as one would raise a *tack* which had been driven into some hard substance. When both ends of the wire are opened, turn to the outside and lever up the middle of the staple in a similar way. After it is raised a little above the level of the paper, it is easily pulled out with small pliers, in the way depicted in Fig. 2. Occasionally through rust or other causes, the wire will break up. It is therefore necessary to separate the parts very carefully, as, when afterwards pulling the sections apart, the broken pieces of wire are very apt to cause a rent in the pages. An ordinary knife will serve to separate the sections. (Fig. 3.) Of course, one must be careful not to cut the paper.

The glue on the back does not usually prevent the easy division of the sections. This old and useless glue may be picked off with the fingers or scraped away with a knife, as in Fig. 4. The former method is to be preferred, as there is less possibility of damaging either the back or the sides of the sections. Every particle of old glue must be removed. The sections are now ready for *hammering*, which is done to flatten out the old groove, and also to ensure that all will lie close together when placed in correct position.

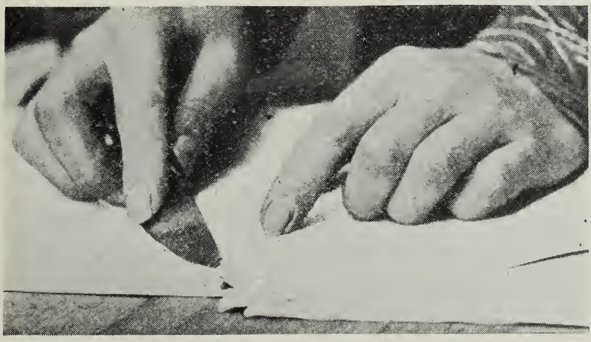


FIG. 4.

HAMMERING out the old groove formed in the sections is managed as follows :—The knocking-down iron, shown in Fig. 5, M, is placed in position (usually on the top of the lying press), where it may rest upon a firm and solid foundation. To keep the sections clean, place upon the iron a sheet of paper. A few of the sections are taken and *knocked up* at the head and back. The sections are held between the hands, and then allowed to drop by their own weight upon some hard and flat surface. This is done alternately at the head and the back, until both edges are quite level. These sections are then placed upon the knocking-down iron. Another sheet of paper laid on the top will prevent the hammer from bruising or damaging the surfaces. The whole are then beaten along the back edge with the backing hammer, shown in Fig. 5, D. A few more of the sections are taken and treated similarly until all are done. Fig. 6 makes this operation quite clear. The blows dealt by the hammer must be of such a character that the sections will not be cut or bruised. To obviate this,

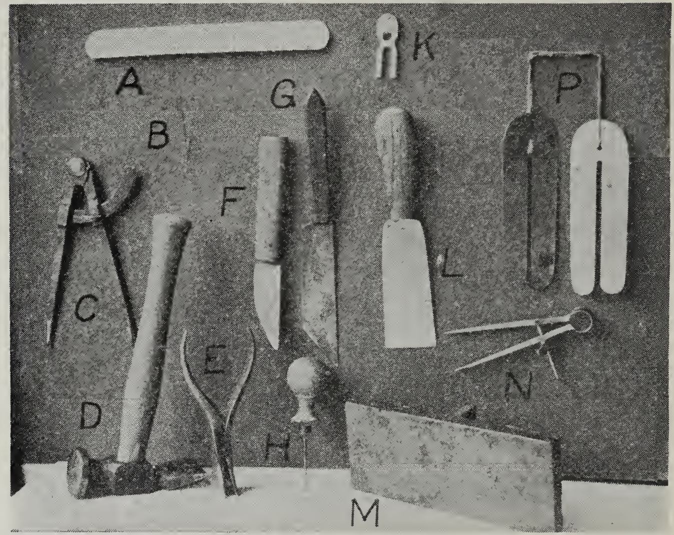
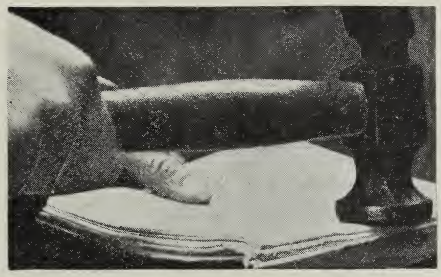


FIG. 5.—A, bone folder ; B, Sewing needle ; C, wing compasses ; D, Backing hammer ; E, Band nippers ; F, Bookbinder's knife ; G, German paring knife ; H, Bodkin ; K, A key ; L, French paring knife ; M, knocking down iron ; N, Spring dividers ; P, a pair of trindles.

after lifting, bring down the hammer quite flat and allow it to rest for a fraction of time before raising it for the next blow. A pounding blow, such as would be delivered when cracking up any hard substance, must be carefully avoided, as blows of this kind made upon paper would certainly bruise and cut it through. The sections will then be ready for *pressing*. If the book should be in sheets which have been folded by the worker, the hammering is dispensed with, and the sections need pressing only—this being sufficient to flatten them and cause them to lie close together.



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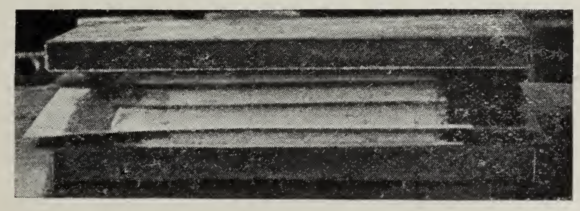

FIG. 7.

PRESSING.—To do this proceed as follows :—Place a pressing board flat on the bench and on the top of this a pressing tin to protect the sections. Lay a sheet of clean paper over this tin ; next put a few sections on this, then another piece of paper, again a tin and another piece of paper, and more sections ;

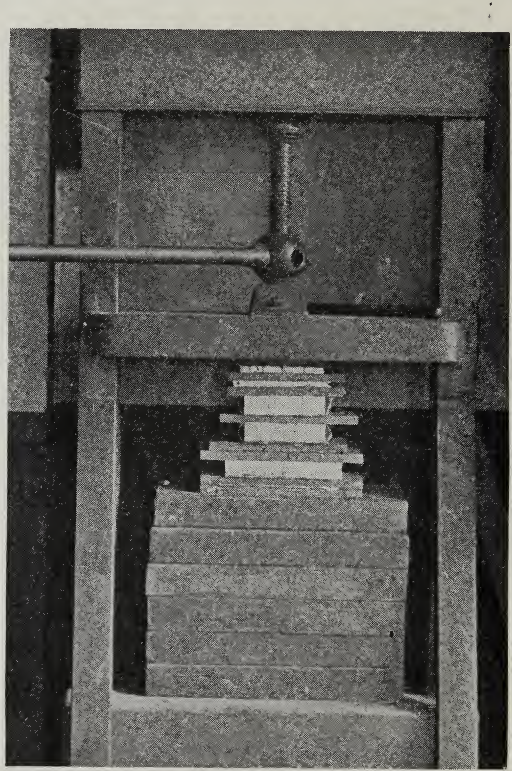

FIG. 8.

and so on until all are in position. On the top of all place another pressing board. (Fig. 7.) The whole should then be put in the press, which is afterwards screwed down tightly. The size of the tins and pressing boards should be somewhat larger than the sections, and on no account smaller. A standing-press is illustrated in Fig. 8.

Precautions to be taken in pressing :—

(1) All the sections must be arranged exactly over each other; and (2) if the book be illustrated with coloured plates, or engravings, they must be protected with sheets of tissue paper; or it is even better to remove them from the book altogether, and fix them in afterwards with guards after pressing. (For guards, see Chapter II.)

(3) Folded maps or similar illustrations must be specially protected, by the use of tins placed on each side between them and the printed matter.

(4) Should the letterpress be of such a character that it is likely to " set off "—this meaning that the printed matter on one page marks, or is partly transferred to, the next page which is facing—it is advisable to omit the pressing, and in place of this to keep the sections as close together as possible when sewing. A small amount of powdered French chalk dusted over the plates, or illustrations, is of considerable assistance in preventing the danger of " setting off."

# CHAPTER II.

## PREPARATION FOR SEWING.

COLLATING.—At the bottom of certain pages in any printed book, letters from the alphabet, or numerals, will be found, these distinctive marks having been printed on the sheets before folding. This was done, of course, when the letterpress and pages of the book were arranged. These letters or numerals are technically called—

*Signatures.*—They are intended to assist the binder when folding, and afterwards in arranging the sections in correct sequence. The style and shape of the printed letters, or numerals, used, varies somewhat with different printers; but as a general rule capital letters—as A, B, C—are employed.

When the sheets, or sections as they are termed after folding, exceed the letters of the alphabet in number, the letters are again doubled, as A A, B B, or they may be even trebled. It is usual to discard the letters J, V, and W. Signatures generally commence with the title-page, which is lettered A, and the first section of the text is marked by B, and should the work be in more than one volume, the number of the volume is also added. Therefore, to collate a book correctly the binder must examine the signatures, in order to be certain that each of the sections has been placed in correct sequence and position. This is also necessary as an assurance that the pages of the book will be found in their respective positions when it is finally bound. After first collating, to ensure that no mistakes have been made, go through them again in the manner shown in Fig. 9. As will be seen there, the whole of the sections to be bound are held in the right hand, and then allowed to fall one at a time from between the thumb and fingers of the left hand. Should there be any loose leaves, maps, plates, or other illustrations, these will require guarding.

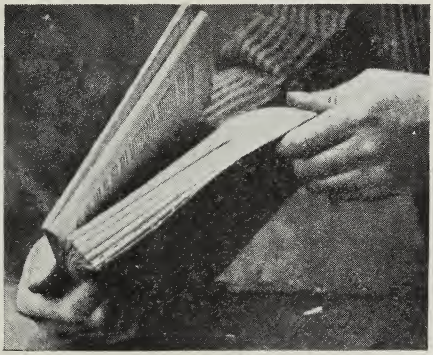

FIG. 9.

GUARDS may be single, double, or full-page, and they may be made from Whatman's bank-note paper, or from fine white linen. When guards are required for plates, engravings, or single leaves, single guards will be found sufficient. The material for these should be cut into strips, which may vary in width from, say, ½ in. to 1 in., according to the size of the book. In length they should be a little longer than the book when measured from head to tail. The plates which are to be guarded may be fanned out and arranged in steps, the distance between each edge being equal to half the width of the guard. A sheet of clean paper (marked A A in Fig. 10) is placed on the top, and the whole may then be pasted at one time. This is done by drawing the brush downwards from the paper marked A A to the bottom sheet. This method is adopted in order to prevent the paste from getting underneath, and thus damaging the other portion of the sheet. Fairly thick paste should be used (see recipe given in Chapter XI). The plates should now be fanned out still more, so as to separate the pasted portions. Commence at the bottom sheet, and work upwards till one after the other the guards are placed in position, allowing each to just cover the pasted portion. They are then well rubbed down, and as the sheets are removed, one half of the guard will project beyond the edge of the sheet, and the other half will be found firmly attached to the pasted portion. Wherever possible the guard should be fixed on the *back* of illustrated sheets.

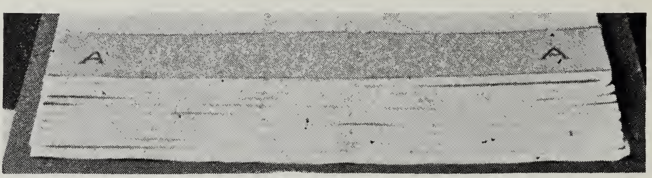

FIG. 10.

In the case of loose leaves, if it be the outside pair of leaves of a section, the guard should be placed on the inside; if a pair of inside leaves of a section, then on the outside. After pasting and fixing, place the whole of the plates under the pressure of a weight. When they are dry the projecting portion of the guard is similarly pasted, then folded over on to the leaf of the section to which it is to be attached, again rubbed down, and afterwards placed under pressure as before.

*Double Guards.*—Should the book consist of thick plates, or cardboard leaves, double guards will be required. Linen must be used for these. It must also be borne in mind that provision for a joint for the sewing must be made, and in addition, a hinge for the plate or leaf to work freely upon. To provide for this we may either cut off a portion of the plate on the inside edge, or make use of extra strips of similar thickness. The width of the cut-off or provided strips will vary according to the size of the book, and may be of any width, varying from ¼ in. to ¾ in. When plates, etc., and strips are cut and prepared, place the pair of leaves or plates side by side, with the cut-off or provided strips arranged between them, in such a position that there will be spaces of equal distance between the two strips and between the strips and the leaves. In deciding upon the distance between each, we may mention that the spaces will vary in width from 1-16th in. to ⅛ in., according to the thickness of the plates or cardboard leaves. When all are arranged in position (see Fig. 11), measurements for the widths of the guards may be taken. The width required will be such as will completely cover the spaces and the cut-off or provided strips, and extend for a distance of about ½ in. on to the leaf or plate. Guards will be required for both sides of each pair of leaves. One guard should be pasted and attached first and then the strips which have been cut off the plates. Note carefully that all the spaces already mentioned are still kept quite parallel, as the least discrepancy in this respect will cause the leaves to open badly. This pair may then be allowed to dry a little, before the whole is turned over in order to paste, and fix a guard on the reverse side. This must be carefully placed quite perpendicularly over the first guard. While the paste is still wet, and consequently the linen guard damp, the edge or end of the bone folder (see Fig. 5, A) is rubbed up and down each of the joints, until the linen guards are attached to

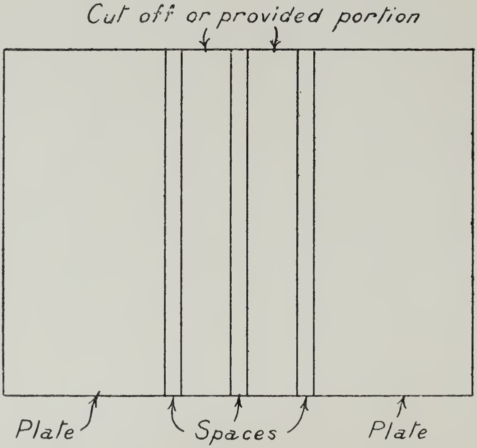

FIG. 11.

each other, and thus the creases for the hinges and middle joint for sewing will be formed. The whole should then be placed under a weight, and in arranging for this it may be borne in mind that any number of prepared leaves—or sections, as they now have become—may be piled upon each other. The damp paste may cause them to adhere to each other, and to prevent this each pair of leaves should be protected with sheets of paper. A full-page guard should be as large as the leaves of the book, plus the amount that will be required to attach the same to the section. These guards are used when it is desired to " throw out " a map or diagram—" throw out " meaning that the whole map, or diagram, when unfolded, will entirely project beyond the fore edge of the book, in order that the reader may refer to the same while reading the text. Before sewing, maps are usually mounted on fine linen, and sufficient of this is left projecting on one edge in order to form these full-page guards. These may then, if desired, be pasted on to one of the blank leaves at the end of the book. When a folded map is to be sewn into the book, sufficient strips of paper must be included to make the back of an equal thickness with the folded map; for, if this is not done, the book when bound will not close up properly. The style of binding to be adopted may have been fixed upon before commencing the folding; but if not, it is absolutely necessary at this stage that the following details should be decided:—

(1) Is the book to be " cut in " or " out of " boards, or is it to be merely trimmed? The latter method is usually termed " uncut."

(2) Are joints to be put in, as is explained in Chapter V ?

(3) What kind of material shall be used to cover the outside—linen, vellum, or leather ?

(4) Is it to be half or whole binding ?

(5) Is the book to have a hollow or a tight back, as is described in Chapter VIII ?

When these questions have been settled, it may be said that the style of binding has been decided upon ; and we may proceed to prepare the end papers.

End Papers.—To the uninitiated we may explain that these are the coloured, or white, leaves found at the beginning and end of all books, and also those pasted down inside the boards. There is almost an unlimited choice of suitable papers for this purpose—plain, coloured, marbled, and figured paper being used. In elaborate books, silk, vellum, and leather form rich and suitable ends. We shall content ourselves with explanations of only two methods by which these end papers are made, though there are other methods which may be adopted with equal success ; but probably the beginner will find that the following answer all purposes.

*Method No.* 1.—Take four sheets of paper—two white, or cream ; two coloured, marbled, or figured. Taste should be exercised in choosing the latter, in order that they may harmonise with the covering of the book. Fold all four sheets centrally, as is shown in Fig. 12, H. Proper allowances should be made in cutting out the paper, so that the sheets when folded will be somewhat larger than the sections of the book. Place one of the plain folded sheets flat upon the work-table. Lay a flat steel straight-edge upon the sheet, with its edge about

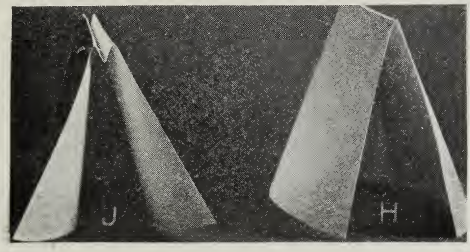

FIG. 12.

3-16ths in. from and parallel with the folded edge of the paper. Then work a bone folder (Fig. 5, A) up and down the edge of the straight-edge to form a crease showing where the paper is to be folded. (Fig. 13.) The folded sheet is turned over on to the

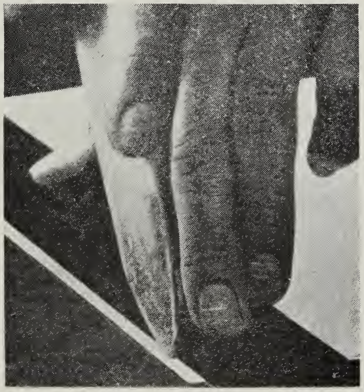

FIG. 13.

other side, and the process is repeated ; and thus the mark for another crease is formed vertically over the other. The sheet may now be turned round, with the folded edge to the worker's left hand, the straight-edge also being placed on the left, lineable with the crease marks. The top sheet is lifted to a vertical position, and bent up squarely over the edge of the straight-edge, thus allowing the folder to form the crease required in the paper. (See Fig. 14.) The whole is turned over, and the operation is repeated;

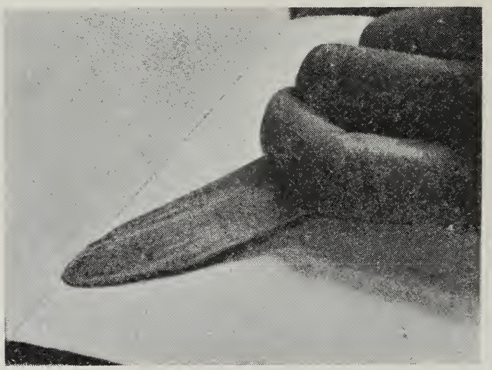

FIG. 14.

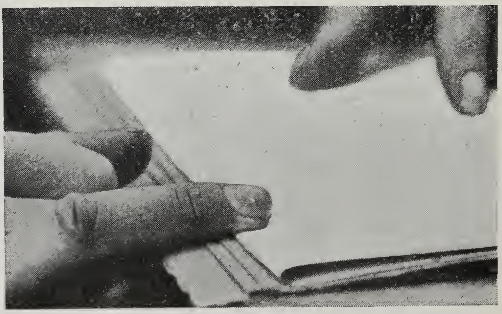

FIG. 15.

the straight-edge is removed, the paper is folded outwards towards the left hand, and thus the shape shown in Fig. 12, J, is produced. The plain sheets only are thus creased—not the coloured. Before pasting the two together, fold out the *creases*, so that the paper will return to the original shape shown in Fig. 12, H. Place the paste on with the finger, as shown in Fig. 15, and attach the papers together as shown in Fig. 16. The papers are then placed to dry under the pressure of a light weight. Many end papers may be prepared at the same time, and placed in a pile, under the same weight. When they are dry it will be found easy to fold them back into the original creases, which will place the four sheets in the manner seen in Fig. 17.

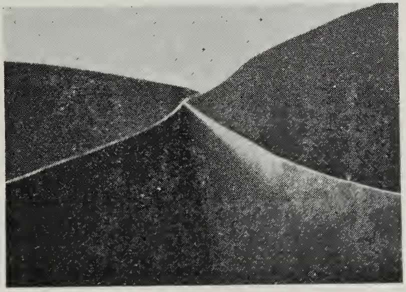

FIG. 16.

N.B.—If the worker will adopt the following rule and always carry it out, little difficulty will be experienced :—Crease and paste only the plain papers, and always attach the coloured ones to these. For the convenience of the reader we shall content ourselves hereafter by describing the coloured, marbled, or figured papers simply as coloured, all others as plain, and as a further guide the four papers are marked numerically,* Fig 17, in order to save a great amount of needless repetition in the following chapters.

*Method No. 2.*—By this method all the sheets for end papers, both plain and coloured, are selected and folded once, as in method No. 1, Fig. 12, H. In practice when folding, the folded edge should always be kept away from the worker. Place one coloured paper flat on the work-table, paste this all over ; take up two plain papers together, lay these in position so that the folded edges at the back exactly coincide with the coloured, and rub them down well. Then similarly paste the top plain paper, and place another coloured one on the top of this, and thus the papers

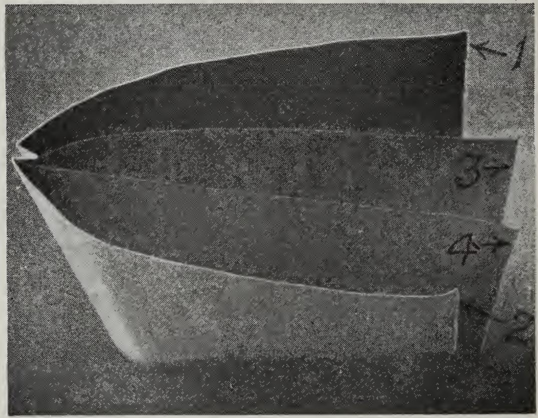

FIG. 17.

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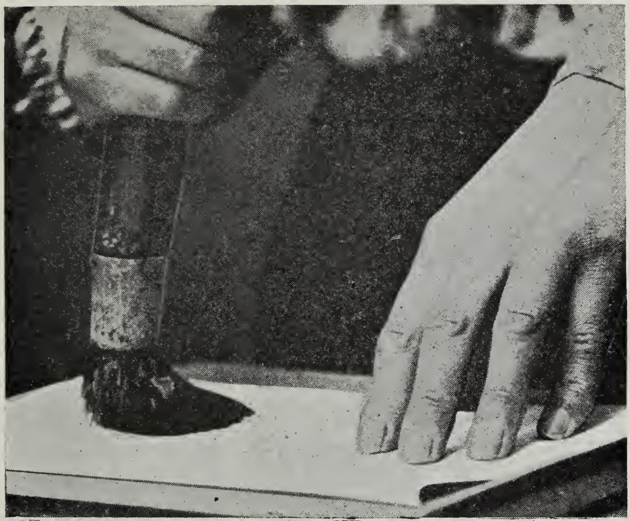
* No. 1, Book paper, or white flyleaf ; No. 2, Waste to be torn away ; No. 3, Book paper or coloured flyleaf ; No. 4, Paste down, or board paper.

Fig. 18.



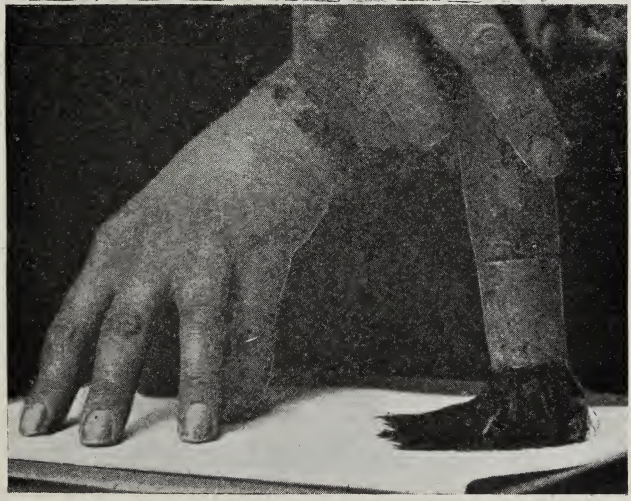


Fig. 19.

for both ends of the book are prepared. Any number of end papers of similar size may be pasted and piled up on each other.

Pasting.—It will be convenient here to give directions to be observed when pasting with a brush. Always commence in the centre of the material to be coated with paste, and work the brush outwards in all directions, towards the outer edges. (Fig. 18.) Then cross hand over hand for convenience in pasting the other portion of the surface. Fig. 19 will explain this. If the above simple rule is always adopted, no paste will ever get on to the under surface. Thin paste such as is recommended in Chapter XI should be used. It is advisable to keep a stock of old news or other papers, to place underneath when pasting, as a means of protecting the surface of the work-table. The pasted papers should receive a *nip* in the standing press to set them well together, and when removed they should be hung upon the " line " to dry.

A bookbinder's line is simply a piece of string or cord stretched across from side to side of a window frame or some out-of-the-way corner in the room. This line will be found useful for hanging up other materials to dry.

Uncut Books.—Books that are to be left as " uncut," *i.e.*, the edges are not cut away with the plough as described in Chapter VI, may, while the end papers are drying, be trimmed to bring the leaves to some degree of regularity. This may be done with a sharp knife and the steel straight-edge, and is technically called " trimming."

Trimming.—After collating, proceed in the following manner. Knock up the sections one at a time at head and back, then set the wing compasses (Fig. 5, C) to the width from back to fore-edge. As it is only necessary to remove the extreme ragged edges, which may otherwise become torn or dirty, measurements are taken which will leave the sections as wide as possible. A cutting board will be required. This may be made of wood, or millboard, the important factor being a flat surface to cut upon. The requisite width having been marked with the compasses, both at the top and the bottom of the first section, this section is placed in position on the cutting board, and two drawing-pins are fixed into the board in such a position that the back of the section may butt against them. The compass marks on the section may then be continued on to the cutting board, both at head

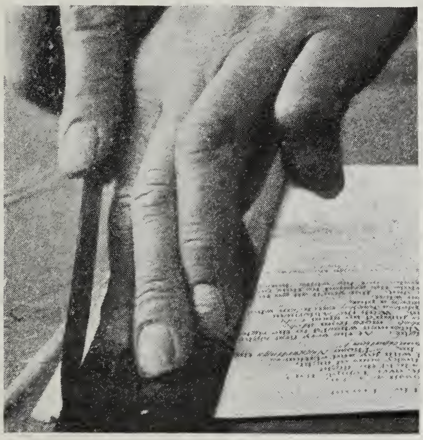


Fig. 20.

and tail of the section, and the knife is drawn along the edge of the section when it is being cut. This line on the board, and the drawing-pins, will serve as a guide for cutting the other sections to the same width. Fig. 20 illustrates this method. A very sharp knife is required, and should be held against the straight-edge, at a somewhat flatter angle than is shown in the photograph. If the knife is held too high, the paper drags and is torn. Always pull the knife towards you, never push it in the opposite direction. In nearly all trimmed books the fore-edge and tail only are trimmed, the head being cut with the plough, as is described in Chapter VI, and afterwards either coloured or gilt. (See Chapter VII for instructions.)

Assuming, therefore, that this method is adopted, the tail is trimmed as follows :—Rest the stock of a try-square against the back of the section, and trim the tail along the blade of the square. This will ensure the tail being at right-angles, both to back and fore-edge. It is characteristic of good work that the smallest possible amount of paper has been cut away during the process of trimming. Note that the end papers will be cut after the book is sewn. To trim the end papers down to the level of the edges of the section, the tops will be cut with the plough when the head is cut ; the fore-edge and tail by placing the steel straight-edge inside the last and first leaves of the book respectively, and between these and the end papers, and then cutting the latter away with the knife quite level with the outer edges of the leaves.

## CHAPTER III.

### SEWING.

THREE methods of sewing a book will be described :—

1. ORDINARY SEWING.
2. FLEXIBLE SEWING ON RAISED BANDS.
3. SEWING ON TAPES OR VELLUM.

Before proceeding to explain in detail the above methods, it is both necessary and advisable for the reader to examine and understand the parts of a sewing press, and also certain preliminary operations—such as "marking up," "sawing in," etc., must be explained. Fig. 21 shows the shape of sewing-press usually adopted. To the reader who does not possess such a press we may mention that many books have been sewn upon a temporary press made up of four pieces of wood fixed together, viz., two uprights and two crossbars attached to them. Still, for satisfactory work to be accomplished, it is better for the beginner to set up a sewing press as soon as possible. The loops of cord seen hanging from the crossbar are intended for the attachment of the lay cords, *i.e.*, the cords on which the book is sewn. For these lay cords, good hempen string, tapes, or vellum may be used.

Marking Up.—This implies the dividing and marking on the back of the sections the positions for the lay cords. These vary somewhat in detail, according to the style of binding adopted, as well as the method of sewing which has been decided upon. Let us take each of the three previously mentioned methods of sewing in the order given.

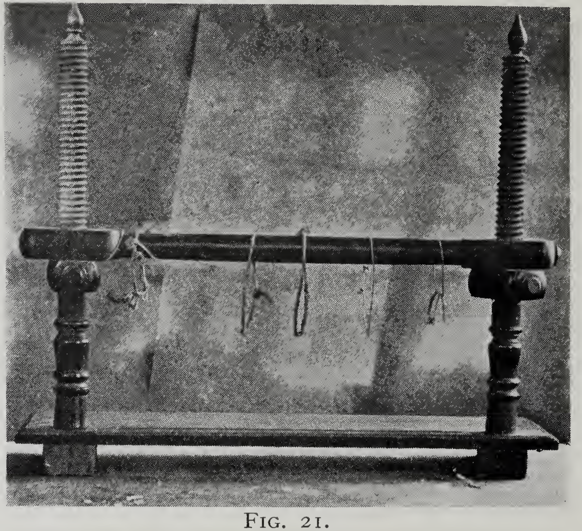
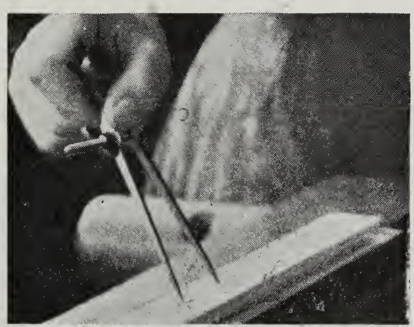


Fig. 21.

(1) Ordinary sewing—although it cannot be recommended—is generally used for cloth-bound and hollow-back books, as also plain tight backs without bands. Marking up for these does not require to be very accurate. Therefore, having decided upon the number of lay cords on which the book is to be sewn, according to the size of the book, proceed to knock up all sections together both at head and back. Then

screw up the whole in the lying press (the lying press is similar to the cutting press, only the top is turned upside down, see Fig. 50), and measure and mark pencil lines on the back of the sections about ½ in. from both head and tail. These marks are intended to show the positions of the "kettle," or "catch-up" stitches. The thread which is used for sewing is here caught up and tied; hence the name "kettle" or "catch-up" stitch. The intervening space on the back, between the two pencil lines

FIG. 22.



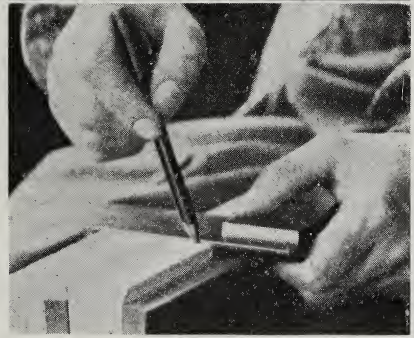


FIG. 23.

mentioned, is divided into equal parts with the spring dividers (Fig. 5, N); these are shown in use in Fig. 22. Four equal parts are required for three cords and six for five cords. As shown in Fig. 23, pencil lines are then squared across the back at each of the points marked, and small grooves, not too deep, should be sawn across these lines with the tenon saw (Fig. 24). The method of holding and using the tenon saw is shown in Fig. 24.

(2) For flexible sewing on raised bands greater accuracy is required in "marking up." This form of sewing is used for tight backs with bands, and such books are covered in whole or half leather. The lay cords in this method of sewing form the foundation for the projecting ridges or "raised bands," which can be seen on the backs of books thus bound, and the leather used in covering is worked up over these cords. The compassing, *i.e.*, dividing, and the squaring, may be done as previously recommended,

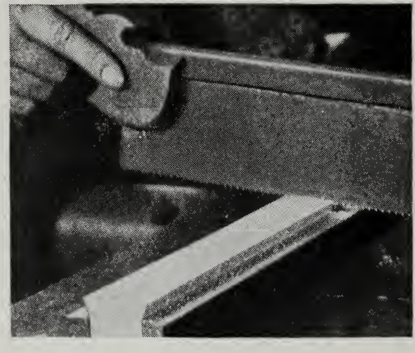


FIG. 24.

but with greater accuracy and care in the measurement of the divisions. One point must be carefully watched : the band (*i.e.*, lay cord) at the bottom of the book must be kept higher up from the tail than the distance of the top band is from the head of the book—a difference in measurement being made according to the size of the book. This difference in the distance of the bands from head and tail is rendered necessary by the fact that, if both are equal, when the book is placed upon the bookshelf it appears to the eye that the bottom band is nearer the tail of the book than the top band is to the head. In this method of sewing, after compassing the divisions, all lines are squared across in pencil, and sawn in, only at the positions for the kettle stitch, and *not* where it is intended to sew the lay cords.

(3) In sewing on tape or vellum, strips of these materials, varying in width from ½ in. to 1 in., take the place of string. The method of "marking up" is here again similar ; but instead of *single*, *double* lines are required to show the position of each edge of the strips of material used. Again for this method the positions of the kettle stitch only are sawn in. This method of sewing is both strong and durable, and books so sewn are covered in cloth and leather. Public Library books are invariably sewn on tapes, and this method should always be adopted for those books which are likely to be subjected to a good deal of hard wear—school and reference books, for instance. Business and account books are also sewn on strong tapes or vellum.

Having explained the preliminary operations, we can proceed to the fixing of the lay cords on the sewing press, and the details of sewing. Hempen string of various thicknesses can be purchased, but the beginner will only require one kind, of medium thickness. For ordinary sewing, one or two strands may be required for each lay cord. For raised bands, several strands are placed side by side, a sufficient number being arranged to give the desired thickness to make the bands show plainly after sewing. The size of the book is the determining factor in this respect.

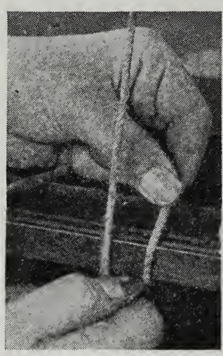


Fig. 25.

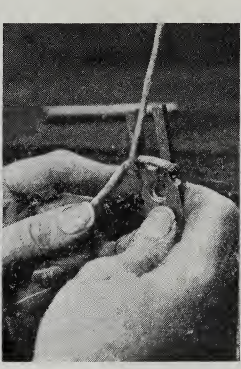


Fig. 26.

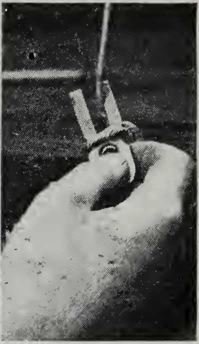


Fig. 27.

Fixing the Lay Cords.—Cut the cord into lengths, and tie them by a sailor's knot to the loops hanging from the cross-bar of the press. Then, taking each lay cord separately, pull it taut with the left hand. A key (Fig. 5, K) is taken in the right hand, and the cord is passed round in the hollowed recess of the key. Still keeping the cord taut with the left hand, slip the key just underneath the press, as in Fig. 25, in order to measure the length of cord required, which must now be pulled tight. Move the key out again, still holding the cord with the thumb and fingers of the left hand to keep it from slipping ; twist once round the key, as in Fig. 26 ; pass the upright cord through the prong, and at the same time turn the key over towards the right hand. This operation will lock the cord and thus prevent it from slipping (see Fig. 27). Key and cord are now lowered through the slot which is provided along the front edge of the bed of the sewing press. Then, pushing the key down with the right hand and pulling underneath with the left hand, give a turn to the key so that the prongs will be brought at right-angles to the slot in the bed of the press. When all the cords have thus been fixed, set them the required distance from each other —the marking up being used as a guide—and give a turn to the wooden nuts on each side of the cross-bar ; this will pull all tight. It is essential that the cords should be tight before commencing to sew. Should one or other of the cords become loose when sewing, they may be tightened by pushing in a small wedge between the loop and the cross-bar. The method of fixing the cords is precisely the same for ordinary as for flexible sewing.

The prepared end papers may be " marked up " from the back of one of the sections—that is, if they (the end papers) were not already marked when the book was divided up. Care must be taken not to saw the end papers when sawing the grooves for the kettle stitch. The side of the end papers (No. 1, Fig. 17), which is to face the book is kept uppermost, and the other side should rest on the bed of the press, with the back edge pushed against the lay cords. It is now ready for sewing. Thread or silk is used for sewing. The required lengths for the needle are obtained by cutting the skein right through once. The lengths are always kept in readiness for use by looping the cut skein round the right-hand upright bar of the sewing press. To do this fold the skein in half and place it round the upright bar; then pass the ends through the loop thus made, and pull them tight. Each thread as it is required, should be pulled from the centre of the loop.

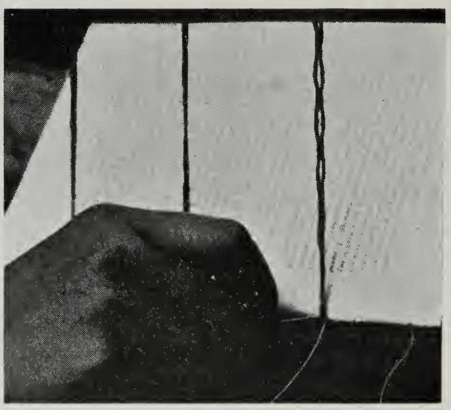


FIG. 28.

(1) ORDINARY SEWING.—In ordinary sewing commence to sew by pushing the needle from the outside to the inside, at one of the marks made for the kettle stitch; draw the greater part of the thread through the hole, leaving only about 4 ins. or 5 ins. of the end hanging out; pass the thread along the inside, and out again by the side of the first lay cord; then

carry it across the outside of this, and in again at the same hole—but, of course, pass it in on the other side of lay cord—as shown in Fig. 28. The thread passes along the inside and out again at the second lay cord, in again through the same hole, and so on, until the other kettle-stitch hole is reached. The needle is brought to the outside at this hole ; the piece of thread left hanging out at the first hole is then held firm, and the thread on the inside is pulled tight with thumb and fingers between each lay cord. Fig. 29, A, is a plan of thread and lay cords, which should further help the beginner to understand this method of sewing. The first end papers should now be found firmly attached to the lay cords, and the first section of the book is then placed on the top. The needle and thread passes in at the kettle stitch hole, which is immediately above the one from which it came out last on the end papers. This and all succeeding sections, and the other end papers, are sewn as just described. When the needle and thread emerge from the kettle stitch hole at the other end of the section, the thread on the inside is again pulled tight with the

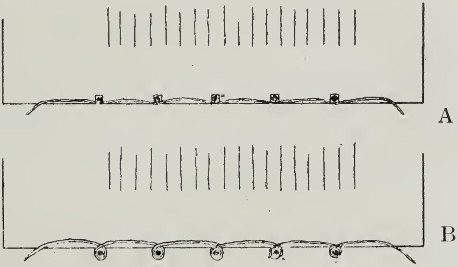


FIG. 29.

thumb and fingers between each lay cord, and is then tied off to the 4-in. or 5-in. piece first left projecting, and when tied the short end may be cut off. The next section having been sewn up to the kettle stitch hole, it is now for the first time that the true kettle stitch is formed, and, of course, a similar stitch must be made at the end of every section throughout the book. The method of making this stitch may be explained as follows :—The needle is passed in horizontally under the previous section sewn, *i.e.*, between that section and the one last sewn (see Fig. 30). Needle and thread are pulled through sufficiently to form the thread into a loop ; they then are passed through this loop as in Fig. 31, and when the thread is pulled tight it completes the kettle stitch. This is really a knot tied once. After the last kettle stitch is made the thread is tied off twice, or it may be—for extra safety—tied off again one or two sections lower down. The lay cord in ordinary sewing is quite embedded into the back of the sections in the grooves which were cut in with the tenon saw (see again

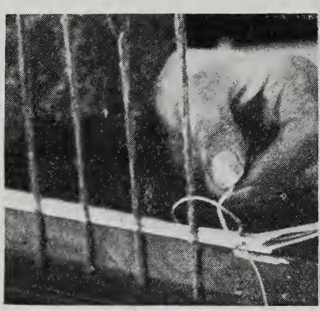


FIG. 31.

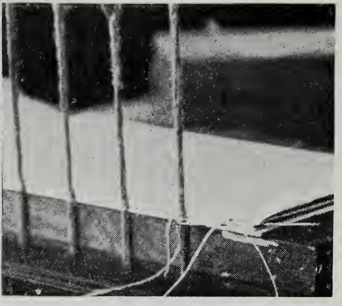


FIG. 30.

Fig. 29, A). In flexible sewing the whole of the lay cord projects from the back.

(2) Flexible Sewing.—For flexible sewing the thread passes right round the lay cord, instead of merely across the back of it as in ordinary sewing; but in other respects the method of arranging and sewing the sections is exactly as we have already described. A glance at Fig. 29, B, will show that in this case the thread must be brought out on the far side of the lay cord, instead of the near side, as in ordinary sewing, thus allowing the thread when passed in again to completely encircle the lay cord. Great care must be exercised to bring out the needle and thread at the exact spots indicated in the "marking up," otherwise the raised bands, *i.e.*, the lay cords, will not lie squarely across the back, and thus will mar the appearance of the back when it is covered and finished. Whichever method of sewing is adopted, it will be necessary, as each section is sewn, to press this section down tightly to the others. For this purpose a small piece of hard wood, the width of which will allow it to pass between the spaces of the lay cords, will be found useful. At one end a handle may be shaped upon the wood in order that it may be held comfortably in the hand. With this the sewer should now and then tap down the sections. The sewing thread will occasionally show a tendency to push itself up the lay cords above the sections; if so, it should be pressed down to its correct position in the centre of the back of the sections. Whether thread or silk is used for sewing a book, it is important to remember that it must be one continuous

piece throughout the book, and therefore, as each needle length is used, the next length must be joined in such a way that the knot is not weaker than the other part. A good strong knot for this purpose is made as follows :—On the new length of thread a loop is formed at the end, as shown in Fig. 32 ; the end of the used-up length of thread is pushed through this loop ; both ends of the loop are then drawn tightly together, and the projecting ends on each piece of thread are cut off. It will then be found that both lengths are as firmly joined together as though they were in one piece. It is advisable to make all these joinings in the inside of the sections ; as, if they are made on the outside, the knots are liable to be broken in the processes which follow.

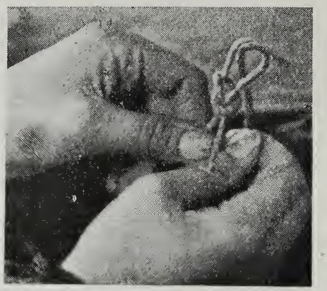


FIG. 32.

(3) SEWING ON TAPES OR VELLUM.—First fix the tapes or strips of vellum in the sewing press. Two only of the loops on the cross-bar need be used. Through these a round ruler is placed, and the tape or strip of vellum may then be looped over this and pinned with an ordinary pin. The other ends are passed through the slot in the bed of the sewing-press,

pulled tight, and pinned with drawing-pins underneath the bed of the press. Then all are tightened by turning the wooden nuts above the cross-bar. Fig. 33 shows the tapes fixed in position, ready for sewing. Of course, the positions are fixed and regulated from the "marking up" on the back of the sections. The method of sewing, as regards the kettle stitch and bringing out the needle and thread by the side of the

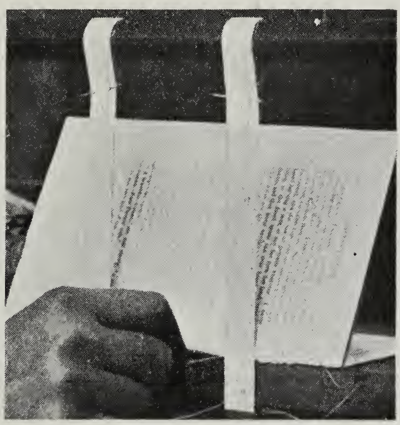


FIG. 33.

tape, is almost the same as for ordinary sewing, but differs slightly in this way:—After about every four sections are sewn, the threads are caught up on the outside of the tape and tied, for the purpose of tightening the threads. To do this the needle is passed underneath the threads already sewn; a loop is formed over them, and this is then tied. The knot should be kept quite central on the tape. When cutting the cords or tapes from the press, allow a few inches to project on each side of the book.

Remedy for Swollen Back.—If after cutting down it should be found that there is too much swelling at the back of the book, screw it up in the lying press, and place the knocking-down iron by the side of the book. Then strike the other side with the backing hammer, in order to force the sections more closely together. Afterwards the cords or tapes may be pulled taut with both hands. Care must be taken not to pull them right out from the sewing, as this may easily happen, unless watchfulness is exercised. If a book has been flexibly sewn round the bands, the loops of sewing thread may prove troublesome when the above method has to be adopted in order to remedy swelling caused by loose sewing. If such be the case, the loops of thread must first be pushed aside.

# CHAPTER IV.

## GLUEING UP. ROUNDING. BACKING.

GLUEING UP.—If the book is to be cut *in boards* (see Chapter VI), it is now ready for glueing up. First knock up head and back, making both square on each side, and level with the back of the book place old cutting boards or pieces of useless millboard. Lower the whole in the lying press, and in doing this care must be taken that the back does not slip down in the middle, as it is very apt to do. The press is then screwed up just sufficiently to hold the book firm while glueing. Fig. 34 shows the operation of

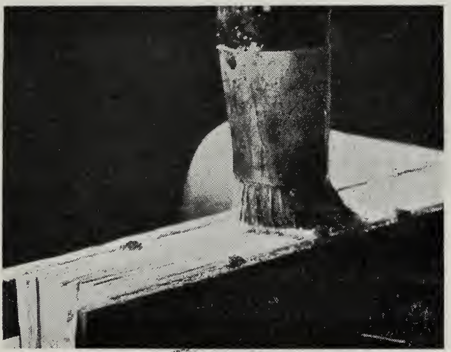


FIG. 34.

"glueing up." The glue should be very hot, and of the right consistency—neither thick, nor thin, but should run off the brush in one continuous stream, about as thick as oil. Fill the brush and rub the glue well over the back of the sections. Work the brush outwards from the centre towards the head and tail, and thus the possibility of the glue getting on to the edges of the book will be avoided. When the book is taken out of the press, just glance over it to see that head and back are still square, and set it aside for the glue to harden a little—but it must not be allowed to rest until the glue is thoroughly set. In technical language, when the glue has ceased to be "tacky," the book will then be in fit condition for rounding.

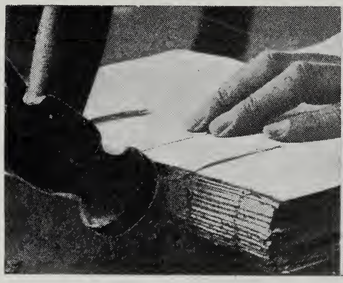


FIG. 35.

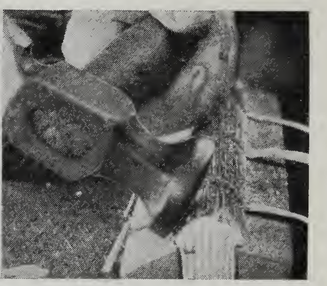


FIG. 36.

ROUNDING.—Fig. 35 is an example of a tape-sewn book, but the method of rounding is similar for all books. As will be seen, the book is lying flat upon the press. A flat table would answer equally well for this operation. The fingers of the left hand should be placed on the upper side of the book, and the thumb on the fore-edge. With the backing hammer gradually draw the sections forward, tapping here and there with the hammer as required. The fingers will greatly assist by pulling the sections over, while the thumb on the fore-edge is forcing them inwards towards the back. The book should then be turned over, and the above process be repeated on the other side; then again turned over; and so on until the correct shape is attained. A well-shaped back, when finished, should have the form of a true arc of a circle. Examine it frequently in order to ascertain that the shape and symmetry of the back are good, tapping it here and there with the hammer to correct any small irregularities. Plenty of time should be taken, and considerable patience exercised to produce a well-shaped back, as no amount of after corrections can remedy an ill-formed one; moreover, whatever shape the back may have at this stage will remain until the book is quite finished. And it is well to remember that nothing is so unpleasant to a person with a well-trained eye as a book well bound in other respects, but lacking the symmetry of a well-shaped back.

BACKING is the term used to explain the operation of bending over the sections to right and left hand, from the centre. This can be seen at the head and tail of any properly bound book, and it will be well for the beginner to examine such a book before commencing backing. Backing is done to form a *groove* —such a groove as will be seen where left hand finger is resting, in Fig. 41—into which the boards afterwards rest, and which thus acts as a form of hinge for the boards to open and shut upon.

The depths of this joint or groove should be varied, according to the thickness of the millboard used, and also according to the material with which the book is to be covered—cloth or leather. For the former the depth should be greater than for the latter, and in consequence it will be noticed that cloth-bound books generally show a projecting ridge where the boards open; but in books covered with leather the board and back are quite flush, and hence no projection is seen. Before backing, it is a good plan to mark pencil dots on the end-papers to denote the depth of the groove. Backing boards are placed on each side of the book, in such a position that the top edges of the boards will just come level with these dots. Great care should be taken to see that the top edges of both boards are quite parallel with each other. Book and boards are then to be lowered into the lying press, and neither boards nor book should be allowed to slip from the original position in which they were placed. It is well to first unscrew the press just sufficiently to allow book and boards to pass down between the cheeks, and then to gradually squeeze the whole down into the correct position, slightly opening the press as occasion may require. If this be done carefully, there is less danger of any part slipping. Beginners must not be discouraged if they find it necessary to take all out of the press several times for readjustment. This misfortune frequently happens to skilled workers. Having adjusted the book satisfactorily, screw up the press very tightly, to prevent any movement during the process. In backing use the backing hammer for plain backs, but for those with raised bands a smaller one will be required, which is narrow enough to go in between the bands (such a hammer as is used for light joinery). Fig. 36 shows the method of using the tool in backing. The blows delivered should be similar in character to those explained on page 17. Commence the delivery of these blows on either side near the centre, and work downwards towards the edges, turning or bending over the sections to right and left from the centre. In bringing down the hammer the movement should be made in the arc of a circle; the hammer-head should be allowed to rest on the sections for a brief space of time, and then allowed to glide off, before it is raised for the next blow. A pounding blow must be avoided, as such a blow would cut and ruin the backs of the sections. It is important that the extreme edges of the sides of the book should be well hammered down on to the backing boards in order to produce a good groove. When once the sections have been turned, to the right or to the left, be careful not to beat the same back again in the opposite direction. Good and bad workmanship in backing will be seen when the finished book is opened. Bad workmanship will result in leaves which are creased up at the back, while with good workmanship the leaves will lie out quite flat right up to the back. If it has been decided to cut the book *out of boards*, the glueing and backing may be deferred until after the book has been cut. The method of cutting will be described in the next chapter.

# CHAPTER V.

## ATTACHING THE BOARDS.

If the book is to be cut in boards, these may now be prepared. Millboard, made from old rope, etc., is the best. Strawboards are a very poor substitute, and should never be used for good work. Bookbinders' millboards are made and sold in many sizes; it is unnecessary to name them all. A few are given here, which should be quite sufficient for the beginner.

| Name of Board. | Size in inches. |
|---|---|
| Half Imperial | 23½ × 16½ |
| Middle or Small Demy | 22½ × 18½ |
| Large Middle or Large Demy | 23¾ × 18½ |
| Large or Medium | 24 × 19 |
| Small Royal | 25½ × 19½ |
| Large Royal | 26¾ × 20¾ |
| Extra Royal | 28½ × 21½ |
| Imperial | 32 × 22½ |

The above-named and other boards are made in different thicknesses, each thickness being known as 6$^{d}$ (sixpenny), 7$^{d}$, 8$^{d}$, 8$^{d}$x (eightpenny one cross), 8$^{d}$xx, and 10$^{d}$ the measurements in thickness ranging from 1-32nd in. to 3-16ths in. The first three thicknesses will be found quite sufficient for ordinary work. If they are not, thicker boards can always be "made" by pasting two boards together (for preference a thick and a thin one). Having, therefore, selected the boards of suitable size and thickness—and for the latter one should be guided by the size of the book—mark out roughly the size of each pair of boards, allowing them to be somewhat larger than the book each way, so as to allow for trimming. The board may be divided at the marks; and if a millboard cutting machine is available, this is easily done; but otherwise a straight-edge and a sharp knife must be used. If it be desired to bind a number of books of the same size, all the pairs of boards should be prepared at the same time; for a set of books, when bound and placed upon the bookshelf, should all stand exactly the same height. The boards may now be paired, and marked in pencil on the outside, "back," "head," "tail," and "fore-edge"; and if there are more than one pair, add "pair No. 2," and so on, according to the number of pairs. These distinctive marks will be found very helpful during the process of cutting the boards perfectly true. For extra work this is best done in the cutting press. The whole of the boards should be fixed in the press, and the plough is used, with a knife kept for the purpose, as the millboards soon wear down a good knife.

Before commencing, it will be helpful if the worker will read Chapter VI, in which is explained the method of cutting the edges of a book. The process of cutting the boards is much the same. To cut the first edges of the boards, place them in the cutting press with a cutting board, protected by a piece of millboard as a " cut-against " ; screw them up tightly, and cut through them with the plough knife. If intended for leather binding, the boards should now be lined with paper; for whole binding they should be lined on both sides and twice on the inside ; for half-binding, only on one side, and the lining should be turned over the cut edges of the boards. They are then nipped in the press, and stood up to dry, and when dry the remaining three edges are cut. The first edges that have been cut and over which the lining paper has been pasted, will be the back edges ; and these edges will be placed in the grooves. The fore-edges should next be cut quite parallel with these. The exact measurement for this is obtained by measuring from the inside of the groove, which was formed in backing, to the width of the first leaf of the book—not of the end-papers. This size should be taken with the wing compass, and then pricked off on to the millboard. A

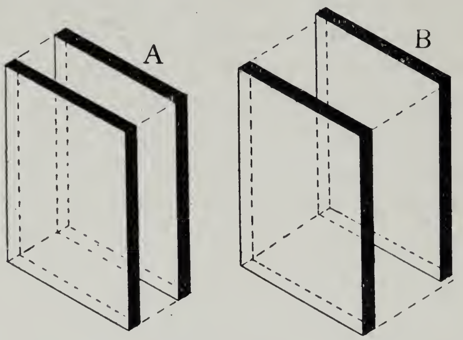


FIG. 37.

line is then drawn through the marks, and the boards are cut through in the press as before. The head or tail may next be cut exactly at right-angles to the back and fore-edges. To ensure this, use the try-square as a guide in drawing the lines across the boards, and test them from both back and fore-edge to make quite sure of the truth of the angles. The length is obtained by setting the wing compasses to the length of the shortest leaf—or if there are any very short ones, select one of medium length—mark off, test with the square, and cut as before. Each pair of boards must now be tested in order to ascertain whether they are perfectly true, or not ; and this is done by reversing them. In Fig. 37, A and B, the boards are shown in the position in which they have been cut. It will be noticed that a space exists between the boards in the illustration ; this has been arranged to show more clearly what is meant. One of the boards is reversed and placed against the other, and if there be any discrepancy it will be seen at once, as at Fig. 37, B. In this example it will be noticed that the edges are not in line. The fault must now be located by the aid of the try-square and measurement, and if only slight it may be corrected by cutting off ; but if the error be considerable, a new pair should be cut and the faulty pair put aside for a smaller book.

Probably the reader will be asking the question : " How are the projections of the boards beyond the book obtained ? " The answer is that the amount taken off the edges of the leaves in cutting will allow just enough for the projections of the boards, which are termed squares.

SQUARES.—Of course, the depth of these can be varied at the discretion of the worker, but if the above directions for measuring the boards are adopted, they will usually work out of satisfactory depth. The next operation is to pierce in the boards the holes which are to receive the lay cords. First place one of the boards in position level with the top of the book; mark on it in pencil the position of the lay cords; turn the book over, and mark the other board in the same way. Square these lines down the board. A short distance from the edge draw parallel lines to cross these squared lines, $\frac{3}{8}$ in. or $\frac{1}{2}$ in. from the back edge of the board—the distance varying according to the size of the book. At the intersections of these lines pierce holes through with a bodkin (Fig. 5, H) of sufficient size for the lay cords to pass through. Each board is then turned over to the inside, and another line parallel with the back edge is drawn, but about $\frac{1}{4}$ in. further in than the holes already pierced. On this line, and about $\frac{3}{8}$ in. to the right hand of the first holes, pierce another series equal in number. The worker should always adopt the above rule in piercing the boards and then no mistakes will be likely to occur. A V-shaped groove

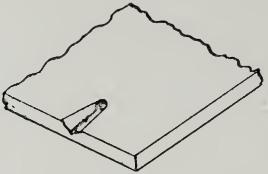


FIG. 38.

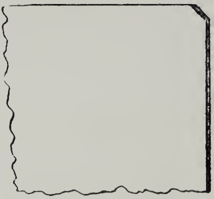
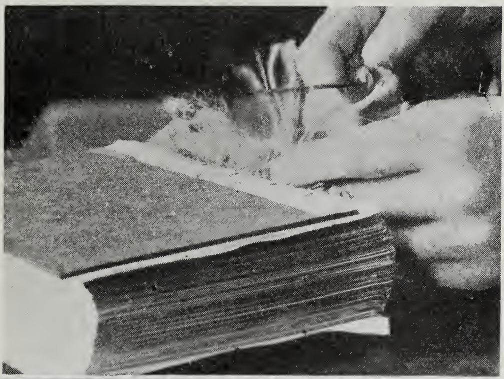


FIG. 39.

should be cut in between the first set of holes and the edge of the board, to form a receptacle for the lay-cords to rest in ; and thus, when the book is finally covered, the possibility of a very unpleasant swelling on the outside at these points is avoided (see Fig. 38). For whole or half binding, the corners at the back

Fig. 40.



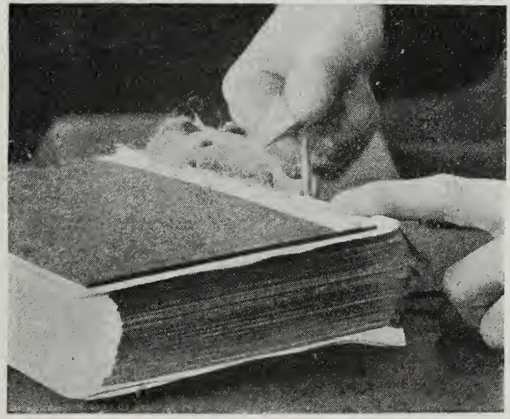


Fig. 41.

edge of the boards should also be cut away, as is shown in Fig. 39, A.

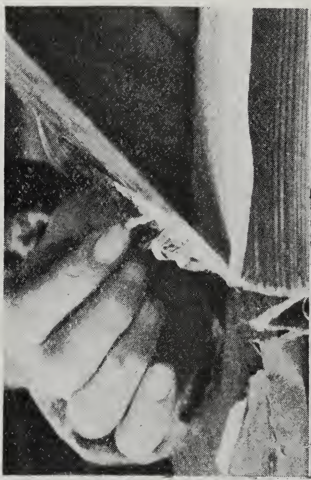


Fig. 43.

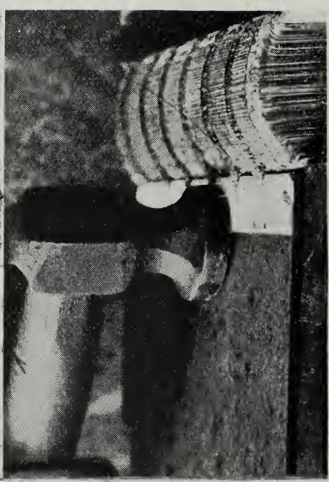


Fig. 45.

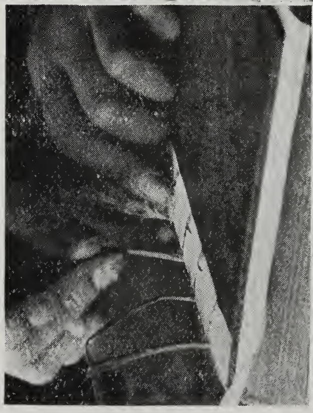


Fig. 42.

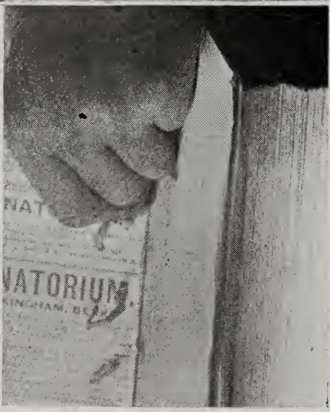


Fig. 44.

Lacing In.—The projecting lengths of the lay cords on each side of the book are ravelled with the bodkin until all are divided into separate strands (see Fig. 40), and these should then be scraped with a knife to thin them down slightly, as shown in Fig. 41. Each lay cord is then pasted between thumb and finger. This will bring all the threads together again, and also point them, and they will then be found to be much softer and more pliable than before. Fig. 42 shows how this is done. Pass the lay cords carefully through the first set of holes made in the boards, threading from the outside, as in Fig. 43. Put the hand inside and pull all the cords tight, and then thread them through the second set of holes from the inside (Fig. 44). Again pull them tight, hammer them down slightly at the second hole, and cut off the cord close to the board. The "laced in" board is placed upon the knocking-down iron, and the holes through which the cords have been threaded are firmly hammered down. Care should be exercised so as not to cut the cord (see Fig. 45). As is shown in Fig. 46, the book is then turned over and the holes are hammered down on the inside. When both boards are hammered, see that they are put back properly into the grooves. The book is now ready for pressing.

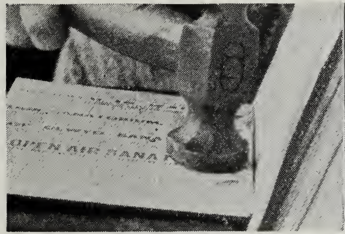


Fig. 46.

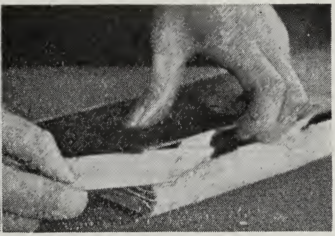


Fig. 47.

Pressing.—Insert pressing tins between the outside end papers and the boards, both at the back and the front of the book. Push the tins well up to the groove in which the boards now fit. These tins are used to prevent the boards from sticking to the book, and they also help to flatten the cords. Other tins are placed on the outside of the boards, and pressing boards are put to cover the tins. Note that pressing tins and pressing boards should be a trifle larger in size than the book. It is very important that the book and the boards should be set very true. Do not hurry, but take every precaution to ensure that all parts of the book are set square. Book, tins, and boards are placed quite centrally in the standing press (Fig. 8), and this is then screwed down very tightly. A number of books may be pressed at one time if each is placed exactly above the other. The back of the book now receives a coat of thin paste, which will moisten the glue used in backing and render the superfluous portion of it easy to scrape off. This is done with the end of an old flat wooden ruler or piece of flat wood kept for the purpose. The book is again pasted and rubbed with a handful of paper shavings to remove the accumulated paste. This operation of pasting and rubbing the back is done for the purpose of setting the back and making it firm and hard. The book should remain fixed in the press for at least twelve hours before removal.

If the book has been sewn on tapes or vellum, the boards are attached by fixing the ends of the tape between them. For this purpose the boards should be "made"—that is to say, a thick one and a thin one should be partially glued together, only a few inches from the back edge being left open in order that the ends of the tape may be pushed in between them. This is to be done with a bone folder, as shown in Fig. 47. The pasting or glueing of the two boards is then completed, and they thus hold firmly between them the tapes on which the book has been sewn. The book is next arranged, put in the standing press, cleaned off, etc., exactly in the same manner as would be done with a book sewn on cords.

JOINTS, CLOTH OR LEATHER.—We now proceed to describe how these are made and put in. They are prepared from strips of linen, cloth, or leather, and are fixed in the grooves of the book, and attached to the inside of the boards and the end papers. They are intended to strengthen the book.

An "extra" bound book should always have a leather joint, but any of the materials just mentioned will be suitable for other books. Three methods of putting in a "joint" will be explained:—

*Firstly*.—A strip of material about 1¼ ins. wide should be cut out, and about ¼ in. of this width is pasted in between the coloured and plain end papers at the time when pasting them together. We assume that these end papers are made according to the description given in Chapter II, Method No. 2. The ¾-in. strip left projecting is folded over and sewn through the fold when the book is sewn (see Fig. 48, which shows plan of end-papers and joint.) It will

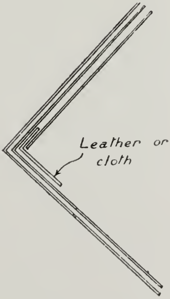


FIG. 48.

be noticed that spaces are left between the papers and joint in the illustration ; this has been arranged so in order to show more clearly what is meant. After the book has been covered, this strip is pasted down on to the boards, and when dry, trimmed out with the *turnover* of the covering material (see Chapter VIII).

*Secondly.*—For this method we assume that the end papers are to be prepared according to the instructions given for method No. 1 in Chapter II. A strip of material 1¼ ins. to 1½ ins. wide is to be cut out ; about ¼ in. along one edge on the leather side is pasted and this is fixed into the folded groove of the end papers (the groove shown in Fig. 12, J). When dry, the material used for the joint should be folded over on to No. 2 end paper (see Fig. 17). It is desirable to temporarily paste in a second waste paper, in order to protect the joint during forwarding. Both this waste, as also No. 2, will be torn out before pasting the joint down to the boards. This latter operation will, of course, be left until the whole of the forwarding on the book has been completed. When sewing in a joint of this description, it is better to use a coloured silk which will match the material used for the joint.

*Lastly.*—In this method the joint may be put in after the book has been covered (Chapter VIII). If such a joint is to be put in, one must be careful at the time when making the end papers according to instructions given in Method No. 2, to leave a space of about ½ in. from the back edges unpasted. Into this space the material to be used for the joint is inserted and pasted between the end papers, and also down on to the boards. The unpasted coloured paper should be cut out and kept for pasting down to the boards later. The pasted coloured paper should be trimmed back, so that it does not reach quite up to the back of the book, thus allowing a small portion of the joint to be seen on the book side. The book is then nipped in a press. If cloth, or linen, has been used for covering, the book may be nipped with the boards closed; but if leather has been used, the boards should be thrown back before nipping. After removing from the press, the book should stand open for a time to dry, and then be closed and placed under a weight.

When leather is used it must first be pared (see Chapter VIII). The shape after paring is shown in

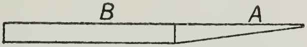


FIG. 49.

section in Fig. 49. As will be seen, a line has been drawn down the leather and the portion on the right marked A is to be pared down to a feather edge. This part will go in between the end papers. The portion on the left (marked B) is pared to equal the thickness of the turnings-in of the cover on the book, and, of course, this portion B is to be pasted down to the boards. A French joint is used when it is desired that the boards should have more play at the joint; and to provide for this the boards, when attached to the book, are placed away from the groove about 1-16th to 3-16ths. in. If leather is used for covering a book with such a joint, it may be left much thicker at the back, and the amount to be pared away is much less in consequence. For this form of joint it is better to sew the book on tapes or vellum.

# CHAPTER VI.

## CUTTING.

CUTTING IN BOARDS.—After the book is taken from the standing press, the pressing tins should be removed and the edges cut in the following order—head, then tail, and lastly fore-edge. In cutting both head and tail the book is placed in the press with the back towards the worker. It is well for the binder to remember that lovers of books deprecate the cutting away of too much from the edges, or, as it is termed, "cutting the book to the quick"; and in order to prove that the cutting has not been overdone, it is advisable to show proof of this by cutting away only just as much as will bring the knife level with the shortest leaves. Consequently these leaves are not actually cut at all, and thus form proof that the book has not been cut down too much. The amount to be cut away should therefore not only have been decided upon when the millboards were measured for the book, but must still be adhered to at this stage. Assuming that the back of the book is now held towards the worker, the millboard on the right-hand side is drawn down until the amount to be cut off the edge shows above the top edge of the board. A waste strip of millboard is placed between the left-hand board and the book ; this strip is termed a cut-against, and is used to prevent the knife from cutting into the boards of the book. The book is then lowered into the cutting press and, in order to keep the book and boards from slipping, the press is screwed up just tightly enough to allow the whole to be pressed down until the top edge of the right-hand board is flush

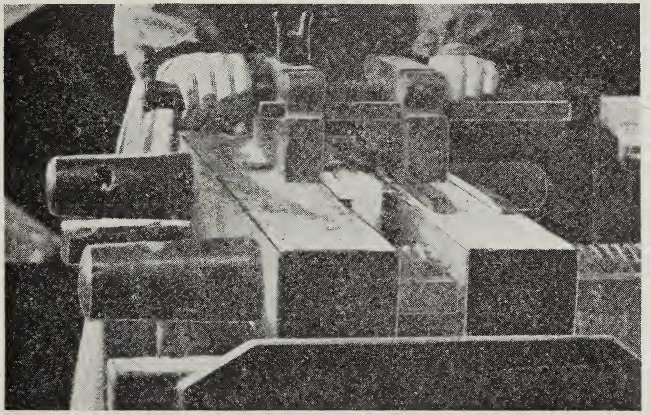


FIG. 50.

with the face of the press, and the left-hand board slightly above and quite parallel with the left side of the press. This is then screwed up quite tightly and the edge of the right board forms a guide for the knife. It is very important to ascertain that the left-hand board is perfectly parallel with the face of the press, as the truth and squareness of the edges to be cut depend entirely upon the care and accuracy with which this process of fixing the book has been carried out. The reader may be reminded that the plough used to cut the edges is arranged to work on the opposite side of the press to that used for the processes described in Chapters II and III. The plough is shown in use in Fig. 50. Before commencing cutting, the face of the plough should be placed on the face of press, in order to ascertain that the knife is resting quite flat and level, as, if this is not so, the edges of the book will not be square when cut. The knife should not cut into the top of the press. If it should do so, paper must be used as packing between the bolt and the knife at the back. On the other hand, should the knife tip up in front, packing must be inserted between the bolt and the knife in front: when it has been carefully adjusted, the wing nut at the top of the bolt is screwed up as tightly as possible, and thus holds the knife perfectly rigid.

Referring again to Fig. 50, the method of grasping the plough with both hands is there shown. The knife should cut on the *forward*, not the backward stroke; therefore, as the plough goes forward, and at each successive cut, a *very slight turn* is given to the wooden screw, and if the knife is quite sharp, as it should be, the edges will be cut perfectly regular and smooth. One of a beginner's usual faults is that of making ragged edges. These may be caused by—(*a*) twisting the screw of the plough too much at a time, and so trying to cut too many leaves at each stroke; (*b*) a dull knife; or (*c*) from insufficiently screwing the book up when fixing it in the press. If the operations have been carefully carried out, when the book is removed from the press the relation of the cut edges of the book to the edges of the boards will be quite parallel, as shown in Fig. 51. Fig. 52 shows a similar book which has been badly cut. To cut the *tail* the book is turned upside down, when, of course, the left-hand board becomes the right-hand. This in turn is pulled downwards until the amount to be cut off the tail projects above the board. The operations of fixing and cutting are precisely the same as those which have been described for

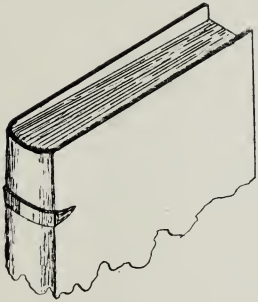


FIG. 51.

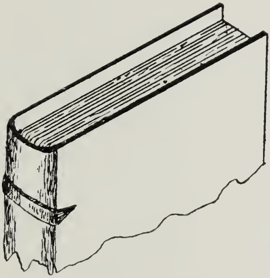


FIG. 52.

the head. The fore-edge, always the most difficult to adjust, is now prepared, by first pushing both boards back into their exact positions, so that the depth of the "squares" at the head and the tail are just equal. The size (or depth) of these "squares" is then taken off with the spring dividers, and a pencil line is drawn down both end papers level with the fore-edges of the boards. The head of the book should be kept towards the worker; and on the right-hand side the depth of the square should be marked by using the spring dividers already set—from the pencil line already drawn. A second pencil line is then to be drawn, which will show the amount of projection that is to be cut off. Both boards are now turned right back and allowed to hang down, and a pair of *trindles* (Fig. 5, P) are inserted, one each between the back edges of the boards and the top and bottom lay cord. The boards of the book are then brought to a horizontal position, and the trindles will rest flat upon the insides of the boards, thus causing the back of the book to become flat. Beech or birch wood cutting boards, previously damped with a sponge, are placed on each side of the book. The whole is then taken in both hands and the rounded back is knocked *quite* flat. This is done by

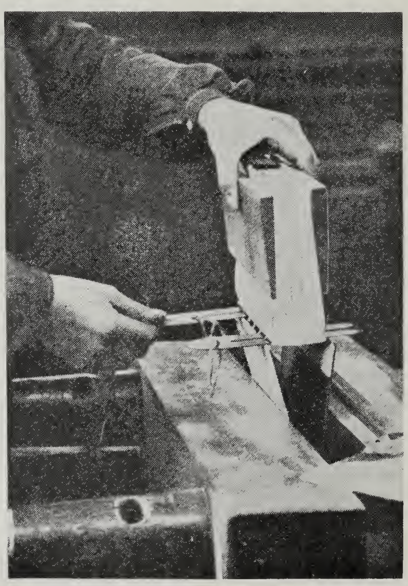


FIG. 53.

striking it upon the face of the press. Both cutting boards are next arranged so that their top edges are quite level with the pencil lines on the end papers—the board on the right-hand side, of course, being kept level with the lower line. The left hand grips both boards and book. The whole is raised up, and the trindles are removed, as shown in Fig. 53. Book and boards are lowered between the cheeks of the press, until the right-hand board is quite level with the face of the press, and the board on the left is allowed to project exactly as far above the face of the press as is indicated by the amount to be cut off.

Fig. 54 shows the method of holding the boards and book when pressing the same between the cheeks of the press. Do not hurry, but proceed patiently until the whole is fixed accurately, as any inaccuracies made in fixing will be apparent when the edge is cut. Should the book be large, or bulky, tie a piece of tape round the sections below the cutting boards; this will help to hold the book well together. As we have said previously, the fore-edge is the most difficult edge to deal with in cutting. The beginner must therefore not be discouraged if it is found necessary to take out the book several times for readjustment, owing to either boards or book having slipped down. Even professional workers have such difficulties to contend against. When all is accurately fixed, we must again remind our readers how necessary it is to screw up the press quite tightly before proceeding with the cutting, which is then accomplished in the manner previously advised for head and tail. It may be noted that the left-hand cutting board here forms the "cut against" in place of the millboard strip, the right-hand board being called the runner. When the book is removed from the press, and the leaves are opened out, the boards may be replaced into their respective positions. The back will then assume its previous shape, and in consequence the fore-edge will become *concave*; and, if all has been done correctly, the edges of the leaves will be quite parallel with the front edges of the millboards. Should they appear to be cut unparallel, the book has evidently not been fixed accurately in the press, and the whole must therefore be re-fixed in the press again and the irregularities be cut away.

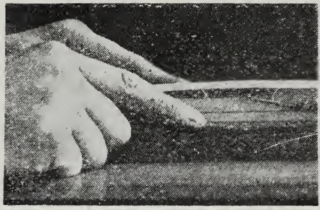


FIG. 54.

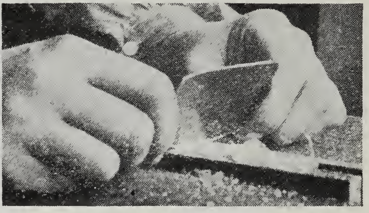


FIG. 55.

CUTTING OUT-OF-BOARDS.—This method is adopted for case work, *i.e.*, for books which are to be put into publishers' cases, or for books which are sewn on tapes. If a guillotine is available, this may be used, the book being cut in the flat after sewing and before rounding and backing. But, of course, the edge produced will be inferior to an edge which has been cut by the plough.

The following method for cutting a book out-of-boards is recommended:—The rounding, backing, pressing, and cleaning of the back are carried out in the way previously described. The boards are then temporarily attached to the waste sheet of the end-papers by a little glue, the right-hand board being glued as much below the top edge as is necessary for the edges to be cut, and the left-hand one below the tail as much as is necessary for the edges to be cut off. A waste piece of millboard is inserted between board and book on the left side, and the book is placed in the press and cut in the same way as for cutting in boards. Books sewn on tapes or vellum are generally cut in this way.

ROUNDED CORNERS.—These are sometimes desired. The corners may be marked out with any object that will describe an arc of a circle. The angles of the edges are then neatly cut away with a knife or carpenter's chisel, and finished with glass-paper.

# CHAPTER VII.

## TREATMENT OF THE EDGES.

THIS part of the binder's work offers plenty of choice for the display of taste in decorative work. Many bookbinders finish the edges of their books very elaborately; but a beginner is advised to limit the decoration to coloured or gilded edges, or to leave them quite plain. But the great disadvantage of the latter is that the edges very soon become soiled and dirty, and consequently much of the charm of a well-bound book is soon lost. We advise the beginner to avoid this misfortune by either gilding or colouring. The former method (if well done) gives the best finish to a well-bound book.

GILT EDGES are produced by attaching gold leaf to the edges of the book leaves. Before this can be done the cut edges must be prepared to receive the gold leaf—first by *scraping* and afterwards by *polishing*. Fig. 55 shows the manner of scraping. As will there be seen, the book is fixed firmly in the lying or gilding press between two boards which are quite flush with the edges of the leaves.

SCRAPING.—The scraper (which is a piece of tempered steel, the extreme edge of which has been burred by rubbing with a bodkin or other steel tool answering the same purpose) is held in a slightly oblique position between the thumb and fingers of both hands. It is then pushed forward so that the burr will just catch the paper, and will produce, when so pushed, a series of fine shavings. This operation requires both care and attention, as careless work will ruin the squareness of the edges on which so much labour was bestowed in cutting. After scraping, very fine glass-paper may be used over the surface of the edges.

GLASS-PAPERING.—This is best done by wrapping the glass-paper around some solid substance, *e.g.*, a piece of cork, wood, or a flat piece of indiarubber. By rubbing the glass-paper up and down the edge a very smooth surface will be produced, which should be covered with a paste, composed of equal parts of black-lead and red chalk, or bole, mixed with a little *glaire*. The recipe for glaire is given on page 127. This paste should be spread equally over the surface with a sponge, and then polished with a fairly hard brush (see Fig. 56). This process gives a body to the surface which will readily receive the gold leaf. Some binders prefer to use red chalk only in preparing the edges.

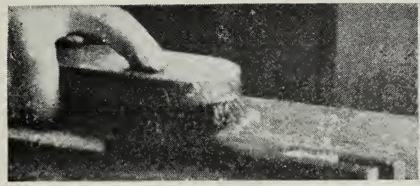


FIG. 56.

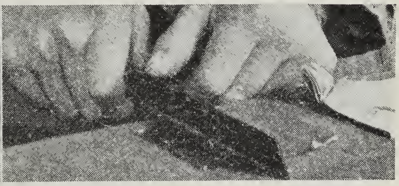


FIG. 58.

In this case the blacklead is omitted, the chalk and glaire only being sufficient to form a good surface.

Gold Leaf for the purpose can be purchased in small books, each containing about 25 leaves, each

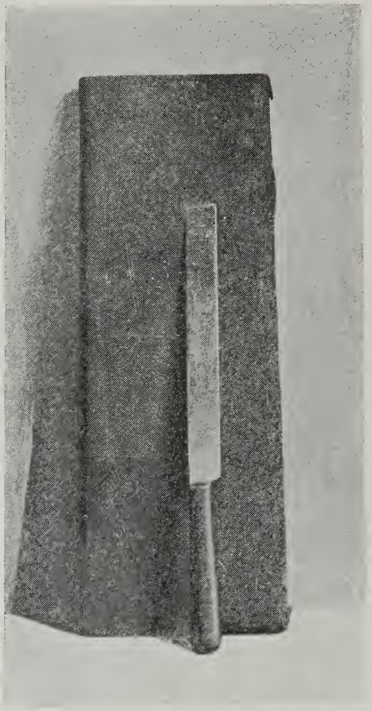


Fig. 57.

3 ins. square. The price of a booklet varies from 1s. 3d. to 3s., according to the quality and thickness of the beaten gold. The squares of gold leaf are first cut to suitable sizes on the *gold cushion* with the gold knife (both are illustrated in Fig. 57). This operation,

which requires some practice, is carried out as follows. Open the book of gold leaf ; slip the long blade of the knife carefully under the centre of one of the squares of gold ; lift it up, and turn the gold right over on to the cushion. Flatten out the gold by just a breath from the mouth, which should be delivered right over the centre of the square. In handling gold leaf a position in the room free from draught should be selected, as otherwise it not infrequently happens that the gold is blown completely off the cushion. Fig. 58 shows the operation of cutting the gold leaf.

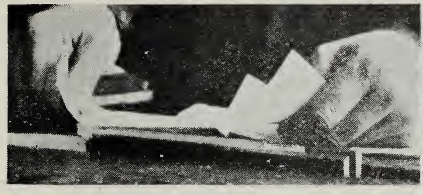


Fig. 60.

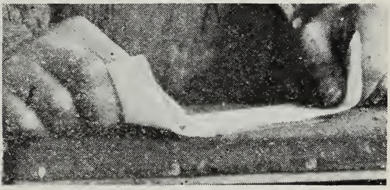


Fig. 59.

The knife should be moved across with a sawing motion. Strips of white paper, somewhat wider and longer than the edges of the book, should have been previously cut, and prepared by rubbing their surfaces with either a little bee's-wax or a modicum of grease obtained by rubbing the surface of the paper across the hair of the head or the skin. This is done in order that the gold leaf may adhere to the paper just sufficiently to enable it to be picked up off the cushion, as shown in Fig. 59.

When enough strips of gold have thus been cut and prepared, a coat of glaire should be applied with a broad camel-hair brush to the already polished surface of the book edges ; and while this is still wet the gold leaf is held over, and gradually lowered until it touches the glaire (see Fig. 60). The moment the gold leaf and the glaire come in contact the glaire will pull the leaf from the paper, and when the glaire dries the gold will hold firmly to the surface. It frequently happens that cracks occur in the leaf when it is being put on. Should such be the case, quickly place another piece of gold over the defective part, and allow the edge of the book to dry for an hour. The gold is then set with the *flat burnisher*, in the manner shown in Fig. 61. It is done by first rubbing a little bee's-wax over the surface of a piece of clean paper, ordinary glazed writing paper for preference. The paper is placed with the waxed side down on to the gold, and the burnisher is firmly rubbed over

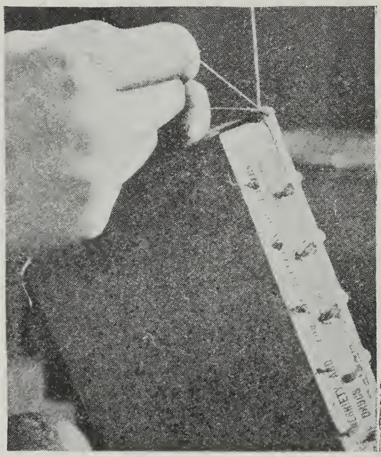


FIG. 64.

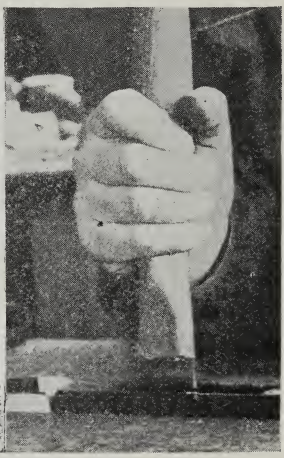


FIG. 61.

this from side to side, not lengthwise. After being *set* through the paper, the gold is burnished in a similar way without the paper.

Plain Colouring for Edges.—Water colours, aniline or Judson's dyes, mixed with clear water, will generally be found to answer all requirements for such edges ; and as a greater variety of different shades in all colours can be obtained by dilution, the worker has a good opportunity of selecting a colour which will harmonise with the outer covering. The colour should be mixed in a saucer and applied to the edges with a small sponge. The fore-edge is first coloured. The sponge, charged with colour, is to be placed centrally on this edge, and worked outwards in each direction until the desired depth of colour is attained. Then follows an application to the head and the tail. Care must here be observed in order that the depth of colour may be made exactly the same as on the fore-edge. The sponge should first be applied at the ends nearest the back and then worked towards the fore-edge—never *vice versâ*—or the result will be a thick mass of colour at the ends of the fore-edge. In some cases it may be desirable to give one or two coats of colour to attain a good body on the surface. An excellent effect is obtained when the edges of the leaves have been slightly fanned out before applying the colour. It is needless to say that the whole of the leaves must be held compactly together by being screwed up in the press, in order to prevent the colour from getting on to the inside of the edges.

After having been plain coloured, or gilded—except when it is desired to leave a dull gold edge—the surface of the edges must be burnished. For flat edges the flat burnisher seen in Fig. 61 is used, but for concave edges the tooth burnisher seen in Fig. 62 is better.

Burnishing.—Before proceeding to burnish, rub a little bee's-wax on to a small piece of soft leather, which may be kept for future use. This is to be rubbed gently over the edges to wax the surfaces slightly, in order that the burnisher may work more freely.

In Fig. 62 the usual method of handling this tooth burnisher is shown. It should be moved carefully backwards and forwards, with a firm and even pressure, and the result of successfully doing this will be the production of a surface quite smooth and free from dull and uneven patches.

Head-bands are generally worked on all books which are covered in leather, whether they be whole or only half-bound. The band is made by wrapping and twisting strands of silk around a solid support—such as a strip of vellum pasted on to thick paper, or a length of catgut, or a piece of ordinary twine which has been covered by pasting around it a piece of plain paper. In the selection of silk for the purpose, the great variety of colours offers plenty of scope for arranging a combination of two or three different colours, which will form a good contrast both with the finished edges and the covering to be used, or, if preferable, one colour only may be adopted. Whichever choice is made, the method of wrapping is the same. We may therefore assume, for convenience, that two colours, yellow and blue, have been selected, and that these are to be worked into the head-band. With the aid of Figs. 63 and 64, and with a brief explanation, we trust the reader will be able to understand the method of procedure, which is really very simple, but requires a fair amount of practice before efficiency is attained.

The book should be fixed in the press quite firmly, at about the inclination shown in Figs. 63 and 64. A strip of the material which it has been decided to use as the foundation is cut off somewhat longer than the thickness of the book, and the silk should be cut into suitable needle lengths. One end of the blue is tied to the yellow and the needle is then threaded with the former.

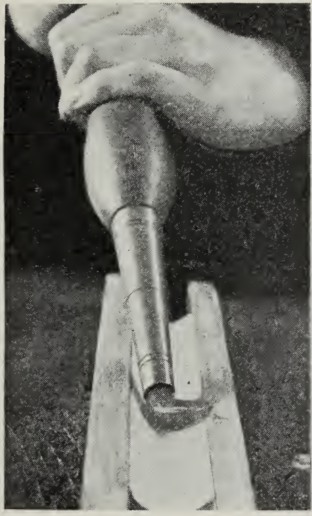


FIG. 62.

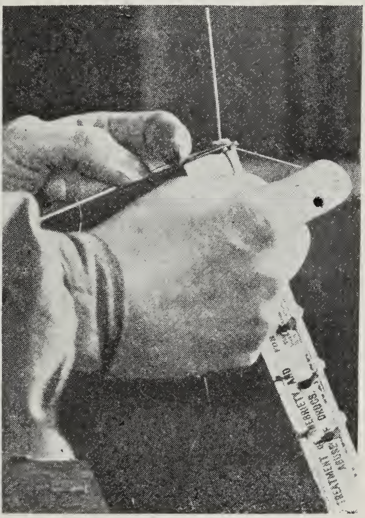


FIG. 63.

The head-band is commenced on the left-hand side of the book, first by pushing the needle downwards through the middle of the leaves of the *second* section—on no account through the end papers. The needle should be held at such an angle that it will come out just below the kettle stitch. The blue silk passes through after the needle; the yellow silk is prevented from passing through owing to the knot previously tied, and is then brought up over the top edge of the book. The needle is again passed back through the same hole, so that a loop above the book edge will be formed. This loop at present should be allowed to project above the head or tail of the book—whichever, of course, is being worked. Through this loop the strip of prepared material is placed, and the needle, seen standing up in the aforementioned figures, is fixed between the sections to hold it in its place. The loop should now be pulled down tightly on to the support, and the silk again brought over from the back will form another strand across the two sides of the support. The yellow silk is now taken in hand, pulled tight, and passed *over* the blue towards the worker's right hand, then *under* the support and over, and this movement is repeated a second time, thus forming *two* strands of this latter colour over the support. The blue silk is now passed over the yellow in like manner, and under and over the support twice, thus forming two more strands of blue. The yellow again goes over the blue, and so on. The junction where one silk passes over the other in the front is termed the beading, and this beading should be kept quite close down to the edges of the book by the pressure of the finger nail. In worked head-bands the quality of the work is judged by the regularity or irregularity of this beading. As the work progresses it is necessary to "tie down" the head-band to the book at about every fourth section from the commencement. This is done by pushing the needle through the middle of the leaves of the particular section where it is intended to tie down, exactly in the same way as was recommended at the commencement. This tying down will be found a great help to the worker in assisting to keep the head-band steady. It is also necessary that it should be done in order to hold the head-band firmly to the book. It is scarcely needful to mention that either of the two coloured silks may be used first to start the head-band. Fig. 63 is intended to show the position of the fingers, and the strands of silk, just when the silk has passed underneath the support. In Fig. 64 the position is shown when one strand of silk is being passed over the other to form the beading. When the worker reaches the opposite side of the book, the needle is again passed through the middle of the leaves in the last section but one, and the silk is then cut off. Both ends are carried round, and are glued down to the back of the book. The ends of the projecting support on either side are to be cut off quite close to the silk. A little glue applied to each part where it is tied down will assist in holding it firmly to the book. To line up the back a strip of brown or other fairly thick paper should be cut off the same width as the back of the book and deep enough to come down to the first band from each end. A piece may also be glued between each band if the book is large and heavy; and if it has a plain back without bands, a strip of paper should be glued the whole length. This paper is firmly fixed to book and head-bands, by being rubbed well with a bone folder, to ensure its firm adhesion, and when dry it is rubbed over with a piece of glass-paper, to remove any paper from the silk strands where they are tied down to the book, and thus make a smoother surface for covering.

Capping.—This consists of a covering of paper placed over the finished edges in order to protect them during the succeeding operations through which the book has to pass. A sheet of paper is cut, in size twice the width of the book, *i.e.*, measuring from fore-edge to back and plus the thickness. The length should equal the distance from head to tail, plus twice the thickness, and have two to three inches to spare. This paper is placed between one of the boards and the end paper, and the board, when closed to the book, holds the paper in position—the latter being moved and regulated until the projections at the head and tail are about equal. The amount

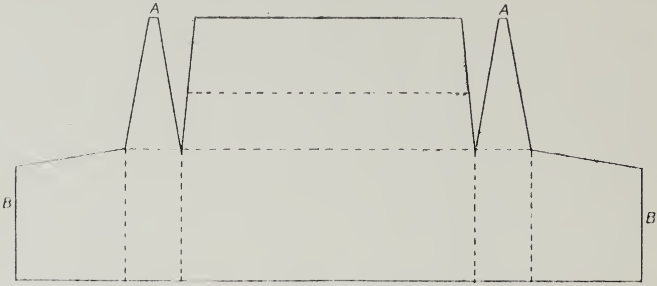


Fig. 65.

projecting at the fore-edge will, of course, be much greater. The paper should then be cut away to the shape shown in Fig. 65. The upper board is now thrown back, and the covering paper is folded at the dotted lines over the fore-edge and down on to the end paper. Next the tongue pieces marked A A are bent over at the dotted lines so as to lie quite flat along the head and tail respectively. The projecting pieces B B can now be folded over the tongues and attached with glue to the large piece which was previously folded down. Now the board may be closed down, and the capping allowed to remain as a covering for the edges until the book is finished.

# CHAPTER VIII.

## COVERING.

THE methods adopted for covering a book differ somewhat in accordance with the use of different materials suited for this purpose. We therefore purpose, in explaining this part of the binder's work, to treat the different methods of covering under the following heads :—

(1) WHOLE BINDING.—In this form of covering, leather of some kind is used to cover the whole outside of the book.

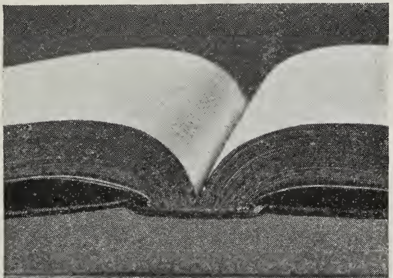
(2) HALF BINDING.—Leather is also used in this case, but only the back, a portion of the sides, and the four corners, are covered with it, the centre part of the boards being covered with cloth, linen, or paper.

(3) CLOTH BINDING.—In this method the books are covered entirely with cloth or linen.

(4) VELLUM-BOUND BOOKS.

Before proceeding to study in detail the various methods of covering a book, it will be helpful for the beginner to thoroughly understand the difference between what are technically known as *flexible* and *hollow* backs. Fig. 66 and Fig. 67 will also be of some assistance in pointing out this difference. As will there be seen, the flexible back fits quite tightly, because the leather with which it has been covered is attached directly on to the back of the book, and the strain consequent on opening is spread over and across the whole back, and also along the joints at the junction where the boards are attached to the book. When it is desired to arrange for such a back the book is usually sewn flexibly, *i.e.*, around raised bands (see Chapter III). One of the disadvantages usually associated with this kind of back is that, if in *finishing*

FIG. 66.



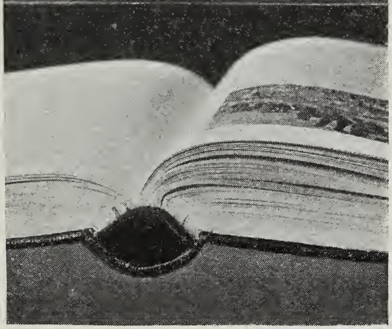


FIG. 67.

much gilt decoration is used to embellish the cover, the frequent opening to which the book will be subjected is apt to cause the gold to crack and peel off. Still, a *flexible tight back* is in every way so much stronger than a *hollow back* that the disadvantage mentioned is scarcely worth consideration.

One of the advantages claimed for the *hollow back* is that the strain in opening is transferred from the material with which it is covered on to the sections of which the book is composed, and therefore any decoration in gold with which the back may afterwards be embellished is not affected by the repeated opening and shutting. Again, it is claimed by some that a book bound with a hollow back often opens much better than a book with a tight back ; but a well-sewn and well-forwarded book with a tight back is generally preferred by the best craftsmen. Should the paper of the book, however, be at all thick and stiff, or should it be desired to cover the book in calf or vellum, it is much more advisable to forward the book for a hollow back than for a tight or close one. It is also well to mention that any other material can be used for covering a book with a hollow back.

Books sewn on tapes and arranged with a French joint possess a very strong and flexible back, as, for instance, Public Library books.

Having digressed somewhat for these explanations, we will proceed to explain the various methods of covering.

(I) WHOLE BINDING.—Assuming that the covering selected is morocco, or other similar leather, and that the book has been sown flexibly on raised bands, and that it has already been lined up at head and tail over the head-bands (as mentioned in Chapter VII), the book may be placed flat on one side upon the skin from which the cover is to be cut. A pencil line should be drawn all round the board, and then the book should be raised up on to its back and rolled over so as to bring the other side down on to the leather. Another line must now be drawn round this side and the leather is then cut out about ¾ in. beyond these lines.

Skins when purchased will be found to be too thick for covering books ; consequently, after cutting out, it is necessary to pare them down to a suitable thickness. The size of the book and the thickness of the skin are factors which must be taken into consideration when deciding the amount to pare off. Unless the leather is very thick, it will not be necessary to pare it all over, but it must be pared all round the outer edges for the same distance as the amount left beyond the boards when cutting out. This projecting portion will be turned in over the boards.

*Paring the Leather.*—The leather must also be pared down the centre to a width sufficient to cover the back of the book and the joint, *i.e.*, where the boards meet the back. Pencil lines may be drawn as a guide to the paring. During the process of paring, the leather is placed with the flesh side upwards on a lithographic stone, a piece of marble, or a sheet of plate glass. In paring large or broad surfaces, the French paring knife (Fig. 5, L) will be found suitable ; but for narrow surfaces or edges, the German knife

(Fig. 5, G) is more convenient. As will be seen in Fig. 68, the leather is held firmly by the left hand, the paring knife pushed across with steady, even pressure, and at each stroke as the tool goes *forward* a thin shaving is cut from the leather. Referring again to Fig. 68, it should be noticed that the angle at which the knife is held is as flat as possible. The bevelled edge of the knife must be kept uppermost. Considerable practice and great care are required before thorough success in paring leather can be achieved. It is quite probable that in the first and early attempts the knife will cut its way right through the leather. This calamity is also possible if the knife is held at too high an angle. It is very important to note that, whatever amount is pared off the leather should be taken away equally. Thin places form weak spots, which will certainly show themselves after the covering is attached to the book. When this paring has been done the book is again placed in position on the cover, and a pencil line drawn upon the leather, level all round with the outer edges of the boards. As has been mentioned

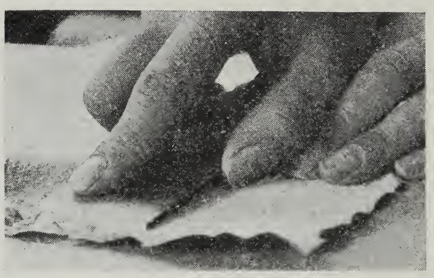


Fig. 68.

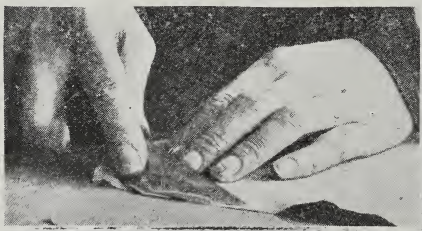
previously, the projecting material beyond these lines is termed the " turn over." The extreme edges must now be pared down to a feather edge in order that the " turn over "shall not form a bulky protuberance at head and tail, and so that the leather, when pasted, may be brought over the edges of the boards on to the insides as neatly as possible. Fig. 69 shows this edge-paring operation. As the paring proceeds the leather is occasionally folded over and the folded pieces are tested between thumb and finger. After some little practice in thus testing, the worker will soon be able to judge whether a sufficient amount has been pared away. When the paring is satisfactorily finished, the leather should receive a coat of paste, and be left to stand for a little time to soak.

In the meantime the raised bands should be examined, in order to ascertain whether all are regular and square. Should it be found that any of the bands are not true, or happen to be somewhat out of the horizontal, the book should be fixed in the lying press, and the defective bands should be damped with a sponge, and gently knocked, or pinched up with the band nippers (Fig. 5, E), until all irregularities are corrected.

*Squares.*—The squares of the book are then to be set, *i.e.*, the boards are to be fixed exactly into their correct positions. The leather should now be again pasted, as by this time it will probably have become somewhat dry. Care should be taken to see that no lumps of paste, no pieces of grit, or bristles from the brush, are left upon the leather, for if so, they will show through the cover after it has been attached.

One side of the book must now be placed upon the pasted cover so that its position coincides with the pencil marks made for the paring. The loose portion of the cover is then gently pulled over the back, and down on to the top board. Then the book is raised, and allowed to stand up on a piece of clean paper upon the fore-edge of the boards. The leather cover is then pressed firmly down between the bands on to the back. A folder should be used for this purpose, and band nippers will assist in nipping the leather into close contact with the projecting lay cords—now to be termed the bands. Fig. 70 illustrates this operation. The band nippers must be worked backwards and forwards across the back, until bands of a good shape have been formed. Before leaving the back, the worker should feel satisfied that the covering is actually in close contact all over. The surplus cover

FIG. 69.



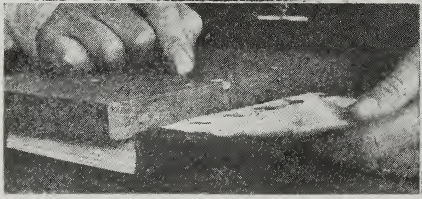


FIG. 72.

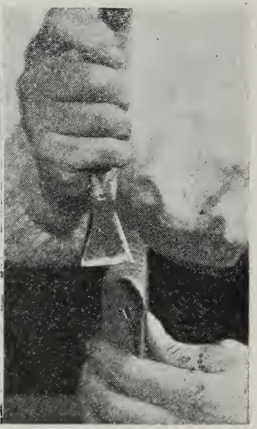


FIG. 70.

at head and tail is brought over the edges of the boards, and turned in at the back, so that here a double thickness of leather is formed. It must not be turned in quite level with the head-band, but a little is left projecting beyond, which is afterwards bent over the head-band to form the "head-cap."

HEAD-CAP.—Practice and experience are needed in order to judge correctly the amount which will be required for this purpose. The examination of a few head-caps on finished books will be of great assistance in gaining the necessary experience. As a further guide, we may mention that if the leather is turned in too much, there will *not* be sufficient material to form the head-cap; and, on the other hand, if *too much* is left above the head-band when it is bent over, a very unsightly cap will result. After a little practice the eye acquires the power of quickly judging the amount required.

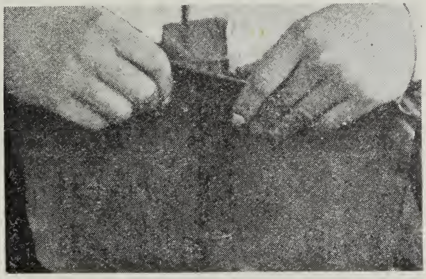


FIG. 71.

TURNING IN.—The method of turning in is shown in Fig. 71. The "turn-over" must be well pressed down on to the inside of the boards, and before the fore-edges are turned in the boards should be set squarely in the joint, as shown in Fig. 72. It will be seen that the book is placed flat on its side, the covered board is lifted up, and a pressing board or a piece of wood with a square edge is pushed well up to the joint. The covered board of the book is then brought in contact with the pressing board and the

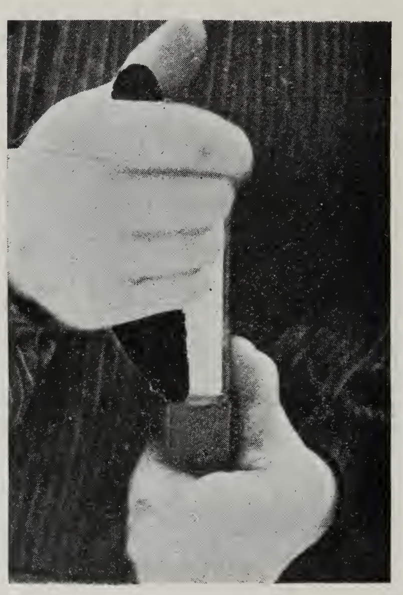


FIG. 73.

leather is pressed in firmly at each end, until it is seen that the joint is set quite square. The fore-edge is now turned in and the leather is drawn well over the corners, and afterwards cut off with the shears. The corners, when dry, are mitred to an angle of 45 degs. The book is next turned over, and the other side is similarly set. A piece of thread is passed round the book at the joints, *i.e.*, at the junction of the boards with the back, and tied. The thread should slip into the little nicks formed by cutting off the corners of the back edges of the boards before lacing in (see Fig. 39). The head-caps are now formed with a folder (see Fig. 73). The projecting leather is first pressed outwards at each end of the head-band, and then flattened on the top. The book is next placed end down on to the paring stone and firmly pressed with a folder round the back edge of the head-cap, and thus the sharp flat edge is formed. In criticising the covering of a book one would notice particularly the shape of the head-caps and the care with which they have been formed. During the process of covering, it may occasionally be found necessary to damp the leather with a sponge and cold water, in order to make it pliable, and to ensure its adhesion to the back and the boards. Clean sheets of paper should

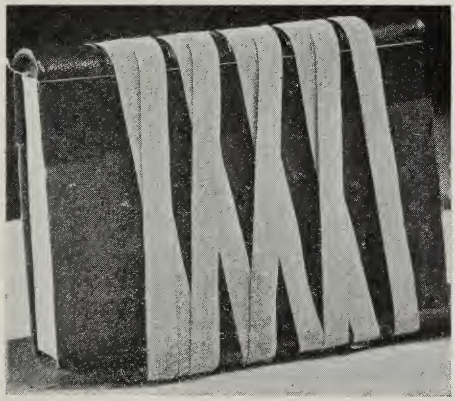


FIG. 74.

also be at hand to rest the covered bock upon when necessary. Waterproof sheets may be placed between the boards and the book to prevent the damp cover from causing damage to the book. The whole is now placed under a light weight for some hours in order to let it set. Should it be found that through harshness the leather does not adhere well at the back, it should be held down by "tying-up" in the manner shown in Fig. 74.

*Mitreing the Corners.*—When dry, the leather at the corners on the inside of the boards, *i.e.*, the "turn-over," may be mitred. To do this, first a pencil line is drawn at an angle of 45 degs. from the extreme corner, and with a sharp knife a sloping cut is made along the line, right through the two pieces of leather, down on to the boards. It is advisable not to cut through the leather quite up to the extreme corners, as this would tend to weaken that portion which has been turned over the boards and so cause it to wear through quickly. The sloping cut mentioned is used in order to ensure a more accurate joint in the mitre. The leather for a little distance on each side of the cut is lifted from the board, and the waste piece is removed. The two edges of the mitre may now be just pressed down to test whether they meet accurately, and if satisfactory, they should be pasted and fixed in position. If there is a leather joint it must be pasted to the board at this stage. The groove of the book is first cleared of any particles of waste glue, etc., the waste end paper is torn out, and the joint is pasted to the board. When dry the corners may be mitred in the same way as the corners of the fore-edge. The turn-over of the leather is next trimmed out to the required depth. For this purpose a line is drawn all round with the dividers, and the superfluous leather is cut away with a sharp knife, and thus the margins are left equidistant from the edges. The board of the book is, of course, below the level of the leather, and to bring it up to the same level the space must be filled in with paper of the same thickness as the turned-in leather. Ordinary brown or cartridge paper may be used, or a thicker paper, which is called "stiffening." The length and width of the space are compassed, and the "filling-in" is cut to the required size. This should be slightly less than the size of the space to be filled in, as the damp paste causes the paper or stiffening to stretch. When the panels have been cut, they should be evenly pasted and stuck in, and they must be rubbed down firmly with a bone folder to ensure their sticking well all over. The book is then stood open until the panels are dry. The end papers are pasted down after *finishing*.

(2) Half Binding.—In this style of binding the leather is used only on the four corners, down the back, and extending over the joints for a short distance on to the sides. This distance may be about one-fourth of the width of the whole side, or, for three-quarter binding, about a third. Any kind of leather may be used, and the other parts of the sides are afterwards covered with cloth, linen, or paper. It is advisable in this style of binding to arrange for either a tight back sewn flexibly, or a back sewn on tapes. In this case, when the book has been forwarded and is ready

for covering, a strip of leather should be cut 1½ ins. longer than the length of the book from head to tail, and sufficiently wide to cover the back, and to extend down the sides the distance already decided upon; and also the four corner pieces should be cut out. The sketch, Fig. 75, shows how the corners can be cut to avoid waste of leather. The leather should be pared in the manner previously described and illustrated in Figs. 68 and 69. The three long edges of the corner pieces marked 1, 2, and 3 in Fig. 75 must be pared until the edges will turn over easily, and to the sense of touch the leather should feel thin. Fig. 76 shows the operation of attaching the corner pieces of leather to the boards. The piece of leather for the back also must be pared on the parts that will go over the back and joints, and so must the turning at head and tail. The latter piece

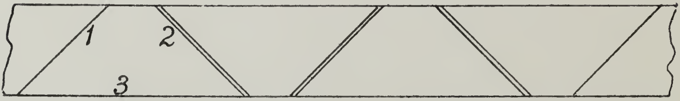


FIG. 75.

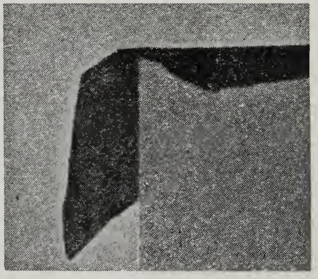


FIG. 76.

is then pasted, put on, and turned in, the back being set squarely in the joint, and the head-cap is formed exactly as in the method given for whole binding. Then the book may be set aside to dry. To prevent the corners and sides from being damaged during the subsequent processes, it is usual to fix the corners on after the book has been finished; but, for the convenience of the reader, the operation is explained here.

The corner pieces one at a time should be pasted, and fixed carefully in position on the boards, then the turnings should be pressed over the edges of the boards, special attention being paid to the extreme point on the corner of the board. The edges of the leather must be firmly pressed over each other with a folder so that one edge laps over the other; and thus will be formed a strong leather corner which will wear well. Instead of this method the corners when dry may be mitred, as previously advised for whole binding. The edges of the corner pieces of leather and that piece which comes over the sides will be somewhat irregular, and these edges should be cut straight with a sharp knife held against the edge of a steel straightedge. As a guide a pair of compasses should be set, and points marked with these from and parallel with the joint on each side. The straightedge may be then fixed to these points, and the leather cut through with a sloping cut. In marking the corner pieces points should be measured with the compasses, equidistant from the extreme corner along the fore-edge and head and tail respectively, so that when the edge of the corner is cut, it will form a true right-angle. When these edges have been trimmed, it will be necessary to cut the edges of the leather which pass over on to the inside of the boards in a line with the outside edges. The board must now be brought up level with the leather on the back and corners, by filling in the space with stout paper, which should also be turned over to the inside of the boards if the leather is at all thick. Brown paper, cartridge paper, or stiffening, may be used, and should be cut to fit, then pasted, and well rubbed down. This is termed—

*Filling In.*—The material selected for covering may be cut exactly to the same shape as the filling, plus an allowance for the turnings at head, tail, and fore-edge. In attaching this to the book, care should be taken that the edges of the material fit accurately up to the edges of the leather. It is then to be turned over the edges of the boards, and well rubbed down on the insides. Glue should be used for cloth, and paste may be used for linen or paper. When dry the turn-over of the covering must be trimmed out to an equal distance from the edges all round, and the panel fixed in similarly to the method adopted for whole binding.

(3) CLOTH BINDING OR COVERING.—This term embraces both cloth and linen covered books. For this class of work it is best to arrange for a hollow back, and the book should be sewn on tapes, rather than by the method known and explained previously as ordinary sewing. Although many cloth-bound books are sewn by the latter method, the former produces a more lasting and satisfactory binding. All books covered with cloth or linen should have a hollow back.

*Hollow Back.*—This is made with fairly stiff paper—strong brown paper answers very well. A piece should be cut a little longer than the length of the book from head to tail, and in width equal to three times the width of the back, when measured across its convex surface. This paper is then folded lengthwise twice, thus making three folds ; both flaps are to be folded inwards from the outside edge, and the two flaps are glued together so that when dry the paper will form a tube with a single thickness on one side and a double thickness on the other. The single side is attached to the back of the book with glue, and in placing it in position it is necessary to fix it quite level on each side of the joint. To ensure perfect adhesion, rub it down well with a folder. This will take some time, for it must be continually rubbed down until the glue is set, otherwise the paper may spring in places and thus weaken the back. When quite dry the folded edges must be slit down at both head and tail, so as to allow the covering material to pass between the single thickness of paper attached to the back and the loose double thickness. This latter will form the hollow back, and will, of course, open and shut at the opening and closing of the book. The covering material may be cut out, due allowance being made for turning in, about $\frac{1}{2}$ in. all round will do. This should receive a coating of paste or glue, according to the material. Then place the book side down on to the material, carefully pull the linen over on to the other side, and turn it in at the head and tail over the boards and between the two papers previously mentioned. As there are no head-bands, *no allowance for head-caps* *is required in this form of binding.* The boards should be set squarely in the joint, as illustrated in Fig. 72, and the instructions which were given for whole binding should be followed.

The fore-edges are then turned in and flattened down. The surplus material at the corners may be cut away with scissors (see Fig. 77), and the material should then be carefully tucked in at the extreme corners of the boards, and fixed down well on the inside. The covering material at the back — *i.e.*, the position for the head-cap in whole binding — should be flattened with a folder. After covering, the book should receive a "nip" in the standing press (unless the covering is grained cloth), and afterwards be placed under a light weight for hours.

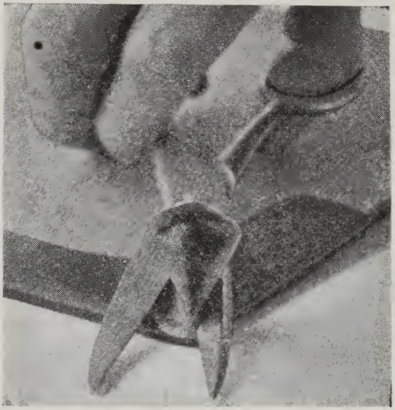


FIG. 77.

If desired, a hollow back may be used for leather covering. In this case false bands are usually put on—that is to say, after the back has been lined up, strips of leather of the same width as the bands are required to be are glued in correct position on to the outside of the lining paper. The leather cover is afterwards worked over these stuck-on bands, in the way previously described for the covering on the raised lay cords. Of course, this is done to imitate a book sewn flexibly, and the book, when placed upon the shelf, cannot be distinguished from the genuine style.

(4) VELLUM-BOUND BOOKS.—As regards the preliminary operations, this style of book may be prepared exactly as for leather, except that, owing to the stiff nature of vellum, it is advisable to forward for a hollow back, and such books should be sewn either on tapes or strips of vellum, and a French joint is better than a close one. When ready for covering, the cut vellum should be lined with white paper on the flesh side : this is the side to be attached to the boards. After carefully pasting the lining paper, place it with the pasted side down on to another spare piece of paper ; then lift it up and attach it to the vellum. Next " nip " in the standing press, and it is ready for pasting and putting on the book. Placing the pasted paper on to another paper has the desired effect of removing the marks made by the paste brush, and clearing off any lumps, or streaky ridges of paste, which if left would show through to the other side of the vellum. The method of covering the book with vellum is much the same as for leather, but the " turnings " may be glued, or damped with hot water. Great care should be exercised not to stretch the vellum in the least, as afterwards the shrinkage will pull the book open, and make it impossible to shut it close. The inside corners should be mitred as for leather in whole binding, or they may be pared and turned in, in the way generally adopted for the corners in half-binding.

## CHAPTER IX.

### FINISHING.

INTRODUCTION.—The term "finishing" is generally applied to all the operations which are necessary *after* the book has been covered. Thus finishing includes the decorative work (if any) upon the sides and back, the lettering, pasting down the end papers, polishing and varnishing.

To become an expert "finisher" requires many years of hard work, during which continued practice in the manipulation of the tools is necessary, and a good knowledge of drawing and designing must also be acquired. The latter is easily obtained by those who wish to improve themselves or are anxious to become experts, if they will join one of the many classes now held in all parts of the country and work earnestly at these subjects.

As a word of advice to beginners, we would urge them to continually guard against the common fault of attempting elaborate work too soon. Let beginners bear in mind that well-covered books can be satisfactorily finished by simply decorating them with a few straight lines, and we advise them to follow this method until they can, step by step, acquire the power to accomplish the most elaborate work—such, for instance, as a design arranged and worked out to fill the whole of the surfaces of the cover of a book, both inside and outside. Moreover, to many people there is a charm in plain good leather on a book, and to these it would be distasteful to have this material covered with a mass of gold ornamentation. Be simple in the treatment of all work, and the artistic instinct will gradually evolve as you go forward.

TOOLS.—Most of those used by the finisher are made from metal, either brass or steel, and, for convenience of handling, are fixed into wooden handles. The names by which they are known are: polishing irons, fillets, pallets, gouges, rolls, centre and corner tools, leaves, dots, flowers, etc., and these are often made from the worker's own designs. The decorative branch of the finisher's work consists of making impressions in the material with which the book has been covered with some of the aforementioned tools—excepting, of course, the first-named, which are used to smooth down the surface of the leather. These, when heated and pressed into the soft and yielding material of the cover, leave an impression of lines, dots, flowers, etc., according to the tool selected.

For certain kinds of books good taste may require that no further decoration beyond the mere impression of the tool, either in straight lines, dots or in design, is necessary. When the finishing is thus left, it is termed—

BLIND TOOLING.—As an example of what can be done in this direction, it will be found that very satisfactory effects can be obtained by using natural coloured pig-skin as the covering material, the lines or design being darkened by damping the leather and using the tools only moderately warm.

GOLD TOOLING.—This is the term used when gold leaf is placed in the blind impressions which have been made by the tools. Silver or aluminium beaten out into thin sheets is also used as an alternative to gold leaf; but a great disadvantage connected with the use of silver leaf is that it soon becomes tarnished when exposed to the atmosphere.

In cheap bookbinding, and where great quantities of books of a similar character are produced, the decoration is stamped upon the cover with prepared metal dies, which are made to fix into a press, and thus the decoration of the whole surface is accomplished at one impression of the blocking press. Of course, such work as this requires little or no artistic skill, excepting, of course, that of the artist who designs the blocks, and the workers cannot correctly be described as finishers. This reference applies more particularly to books bound in cloth, *i.e.*, cloth work; but in these days of cheap editions many leather-covered books are also finished in this way. It is, therefore, well to make a distinction between such work and hand tooling, as the best decorative work must and always will be accomplished by the latter method.

HAND TOOLING, then, consists of using the finisher's hand tools to work out all decorations upon the book, whether they be a few simple straight lines, or a combination of lines and other designs, worked out into a harmonious whole, suited to the character of the book, and in good taste.

The following illustrations of decorative finishing have been made from photographs of books which were all designed and executed by pupils who have attended the bookbinding classes held at the Acton and Chiswick Polytechnic, Bedford Park, London, W.

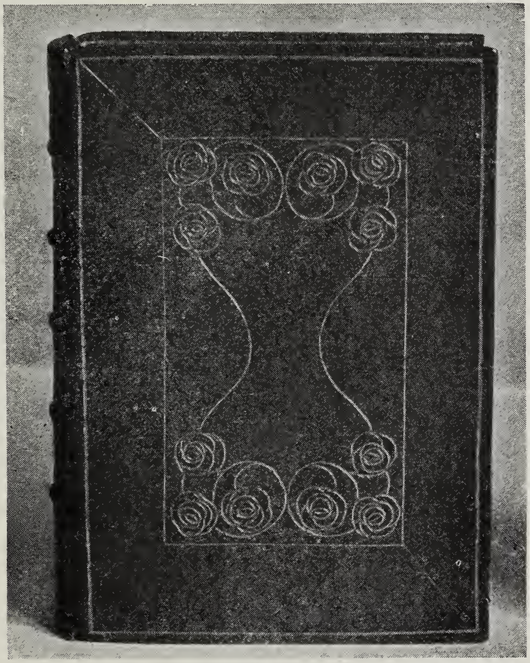


FIG. 79.

These should be of interest in showing the progress made by pupils who but a few years ago were beginners. We trust that those among our readers who are just entering the ranks of would-be bookbinders will receive some stimulus from these illustrations, which should induce them to go forward until they, by careful and persistent application, and constant practice, will be able to achieve similar success. And we can promise that their efforts will be to them such a source of pleasure, and the finished books will become such delightful possessions to themselves and their friends, that they will be repaid tenfold for the labour and time bestowed upon their work.

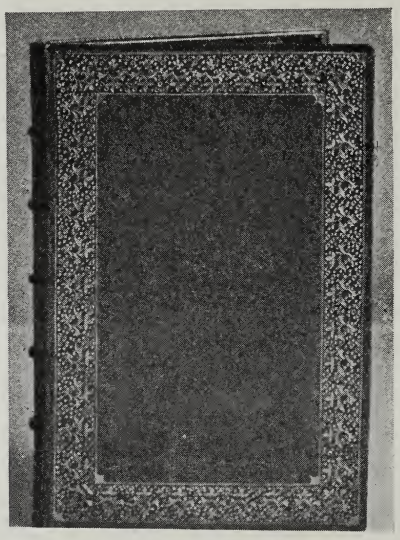


Fig. 80.

The frontispiece (Fig. 78) is taken from a book which was bound in olive green levant; the flowers were inlaid with yellow levant and tooled in gold. The whole was designed and executed by Miss G. Iceton.

Fig. 79 was designed and executed by Miss D'Oyley. This book was covered with brown levant morocco, inlaid with red morocco.

Fig. 80 is an illustration of a book bound in brown levant morocco, inlaid with green morocco, and finished with gold tooling.

Fig. 81.—This book was covered with blue morocco, inlaid and gold tooled. Both this and Fig. 80 are examples of work done by Miss G. Iceton.

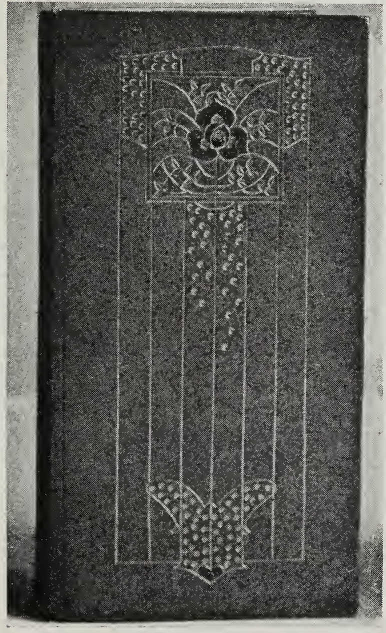


Fig. 81.

Well finished whole-bound books are usually decorated on the inside of the boards as well as the outside. The inside decoration may consist of straight lines, or may be a design which is in keeping with the outside decoration.

Fig. 82 is an illustration from the inside cover of a book, and is intended to give the reader some idea of the treatment required. In Fig. 82 a leather joint will be seen. The end papers were cut to form the panel, and will be seen fixed between the "turnings" and the joint. In elaborate work a leather panel is sometimes substituted for the board papers, and this panel is frequently decorated with a design tooled in gold, and is termed a *doublure*, or *double.*

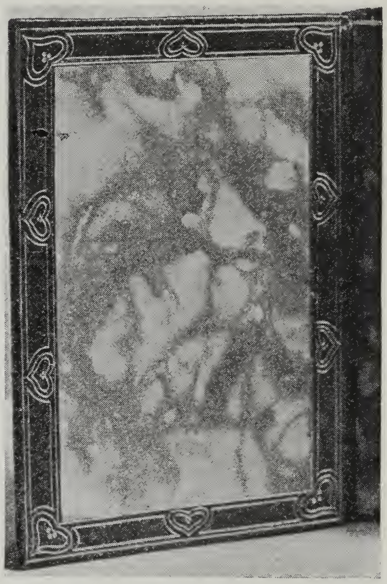


FIG. 82.

In Chapter X we propose to give details of the various processes required in finishing.

# CHAPTER X.

## FINISHING.

ASSUMING that a whole-bound book covered with morocco, or similar leather, is ready for finishing, and that it is desired to finish it by gold tooling, the first operation will be to wash over the cover with paste water, or with vinegar of the *best quality*. If the former be used, it should be made by adding a little paste to clear water, just sufficient to give the water a slight milky appearance, and this mixture should be well beaten up. Paste water is better for porous leathers than vinegar; but the latter may be used for morocco, as this is classed as non-porous leather. The advantage of using vinegar is that it keeps the leather in a moist condition; but it is essential that vinegar of good quality should be obtained, as so much is made that is inferior and usually contains sulphuric acid, which is a very undesirable constituent and one that is likely to be detrimental to the leather. The object of this washing is to prevent the "glaire" (see Chap. XI) sinking into the leather and staining it. A convenient method of applying the wash is to use a small sponge, which can be easily saturated with the wash if it be placed in a saucer or other open vessel.

Hold the book in the left hand, with thumb and fingers placed between the two boards and the book, so that the boards may be held open and away from the book. This action and the capping on the edges will prevent the damp from damaging the leaves. The wash should be evenly spread all over the surface of the leather, and the book should afterwards be stood upon the edges of the boards to dry. When dry, the lines of decoration may be "marked out." If there is to be tooling on the inside of the cover, this is usually done first; secondly, the back is lettered and decorated, and lastly the tooling is executed on the sides. One of two methods of

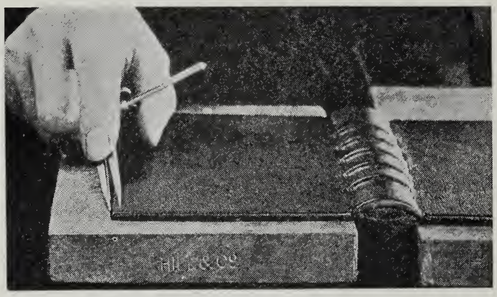


FIG. 83.

MARKING OUT may be adopted. Firstly, as shown in Fig. 83, the book should be placed in the finishing press, with pressing boards to support the boards. For the inside marking out, the book may rest on the top of the press, with one board open, which may also be packed up level with pressing boards, the book being afterwards turned over and the other side treated similarly. The requisite measurements are marked with the spring dividers, and the marks thus made are joined together by lines made with a bone folder, which is guided against the edge of a flat ruler. This method answers very well for straight lines, but for more elaborate designs the following method should be adopted :—Select a sheet of paper which is thin and tough, and on this mark out the size of the book to be decorated. Inside these lines draw out the design in pencil, or plan out the same with the finishing tools. The latter may be done by smoking their surfaces over a flame, and then impressing them upon the paper. When the design is complete, the paper may be held in position on the book, by the aid of a little paste at the corners or by metal clips, and the tools are afterwards heated on the stove and impressed through the paper on to the book. The same paper will answer for several books if required. It may be found necessary to go over the impressions again on the cover, to make them clearer, after the paper has been removed. All straight lines should be ruled directly on to the cover after the removal of the paper. Only the positions of the corner angles should be marked through the tracing paper. Before proceeding further with explanations as to the correct method of using the various finishing tools we will explain an important preliminary detail, viz., the heating of finishing tools.

HEATING FINISHING TOOLS.—To heat these tools the finisher's stove, seen in Fig. 84, is shown as an example of the kind now in use. The heat is obtained from a jet of gas conveyed by a tube which is attached to the stove. A practical knowledge of the correct heat at which to apply the tools is absolutely essential to ensure success, and such knowledge cannot be obtained from a book, as it is very largely a matter of experience. We cannot, therefore, promise much help in this direction; but in addition to the instruction here given, the beginner must, in spite of many failures, continue to persevere, until this difficulty of obtaining correct knowledge of the exact temperature at which to apply the tools has been mastered. First we may add, as a word of caution, that it is a common fault with beginners to use the tools too hot. The heat required varies according to the kind of leather to be tooled. For calf and other porous leathers the tools will need to be hotter than for morocco. As a further help to the beginner, the following degrees of heat may be mentioned:—

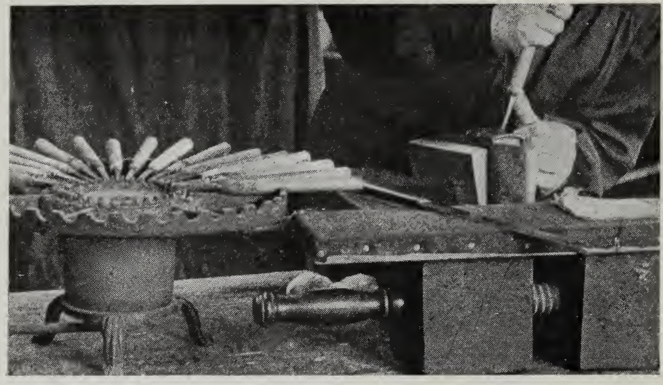


FIG. 84.

(1) Just warm. After the tool has been heated on the stove, apply a drop of water to the shank of the

tool, and if the moisture just dries off without hissing, it may be considered to be "just warm."

(2) Should a hissing sound be produced after the application of the drop of water, it has passed the above stage, and may be termed of "medium heat."

(3) When the water placed on the tool hisses, and dries up instantly, the tool is "hot." In any heat past this stage there will be a danger of burning the material. For morocco and similar leather the heat "just warm" will answer well; for porous leathers, linen, etc., the second stage, "medium heat," will generally be satisfactory; but that depends on whether the leather used is dry or moist. For instance, a book that has been covered a week or so will usually require tools rather hotter than a book covered the day before finishing.

The desired heat for the tools is obtained by regulating the jet of gas and, if they become too hot, by cooling them on a wet sponge which is placed in a saucer. As another point to help the beginner, mention must be made of the fact that the speed with which the tools are applied to the work should vary according to their degree of heat. If just warm they do not need to be worked as quickly as when hot, while hot tools should be placed in position and lifted off again as quickly as possible. Tools when heated should not be kept hovering over the work while the worker is making up his or her mind where to place them, as this dries the albumen in the glaire.

LETTERING.—During this process and that of decorating the back, the book should be fixed in the finisher's press with the back of the book upwards. A strip of green baize or other protection is placed on each side to prevent damage to the leather. The title, name of author, year of publication, and any other detail it is thought necessary to letter in, should be written out on a slip of paper, which can be kept in front of the worker for reference. The lettering tools should be placed in proper order upon the stove, as shown in Fig. 84, and after being laid out in correct position, they should be picked up, used, and returned again to the same position, so that they may be ready to hand for picking up again if required. In this way the worker will soon become accustomed to find the tool required without wasting time in looking them over. It is advisable to impress all

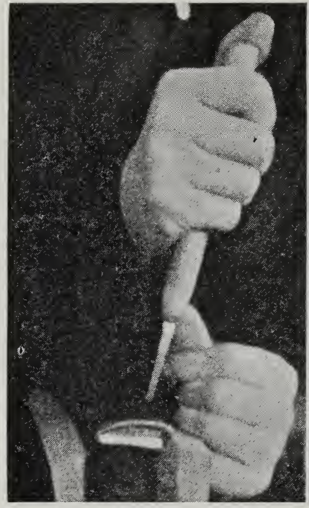


FIG. 85.

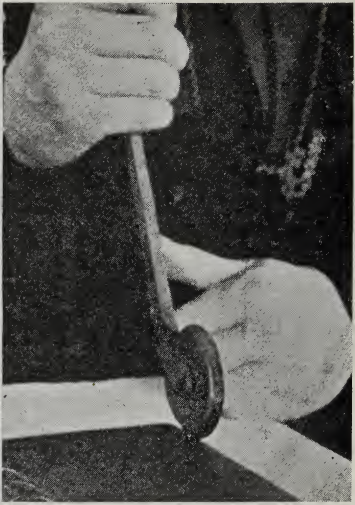


FIG. 90.

the lettering in blind first, and the tools may be used cooler than for gold tooling. The correct method of holding and using the tools is shown in Fig. 84, and a larger view of the same operation may be seen in Fig. 85. The face of the tool should be kept level with the surface of the cover; an even downward pressure should be given when making the impression, and it should be made as uniformly as possible. In spacing out for the lettering, whether title, author, or date, etc., one must be guided by the length of the title, etc., and by the size of the book. The title is generally placed in the second panel from the top of the book, and the author's name may be also placed in

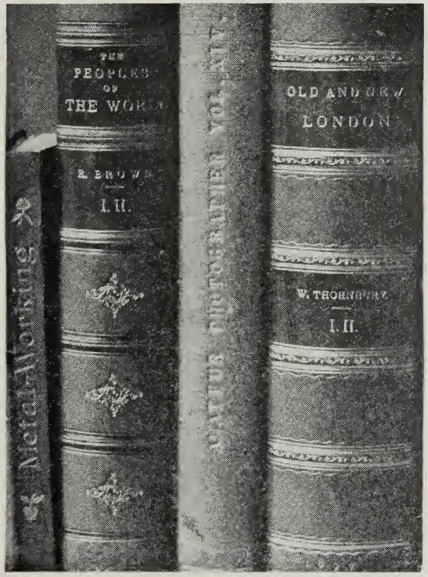


FIG. 86.

the same panel if the title be a short one, or in any of the three following panels. If the back is a plain

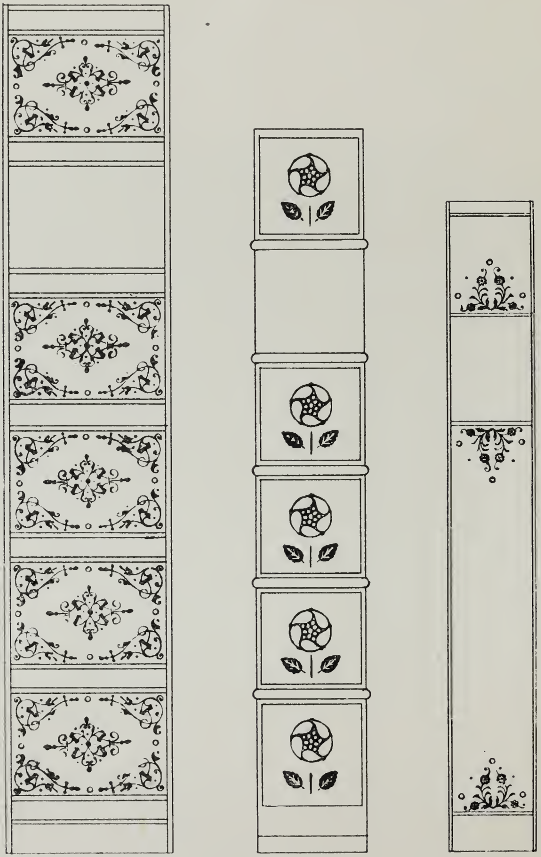


FIG. 87.

one, without raised bands, the lettering may run from tail to head—that is, if it is impossible to get it across; but for a book with bands the lettering should be placed in the panels, *i.e.*, the spaces between the bands. In Fig. 86 four typical lettered backs are shown. These examples may be considered merely as suggestions. Beginners in their early attempts at lettering will find it very profitable and helpful to space out such as will be required on strips of paper and then to place this paper on the back of the book in the space to be lettered. The letters can then be impressed through this paper in a similar way to the method of applying the design to the sides. The decoration, plain lines, etc., with which the back is to be tooled should also be *blinded in.* Fig. 87 gives illustrations of three backs, showing different ways of decorating the back. Instead of placing the lettering directly on to the back of books covered in *calf* or *linen*, lettering pieces are sometimes used. These are cut from leather which will contrast, or harmonise, with the colour of the cover, and they must be pared to the thinness of paper, and pasted on to the back. But it is important to add that although to many persons these lettering pieces are very pleasing, and seem to add a finish to the appearance of the book, in the course of time they are apt to curl at the edges and finally peel off—this being caused, no doubt, by the constant opening of the book, and the drying up of the mucilage by which they were held.

GOLD TOOLING.—For this the blind impressions must be pencilled in once or twice with finisher's glaire. A small camel-hair or sable brush is used for this purpose. Glaire is used to hold the gold leaf in the impressions, and great care should be exercised to keep it from spreading beyond the impressions, as, if it should do so, the leather will have a soiled appearance. If the temperature of the room is high, the glaire will dry very quickly ; therefore, only as much work should be glaired as can be finished before it becomes too dry. It is well to put the gold on as soon as the glaire is just dry ; this will ensure the gold adhering well when worked in with the tool. The gold leaf should be placed on the cushion, and cut up with the knife into suitable portions in a similar way to the method recommended for edge gilding in Chapter VII. For picking up the gold a pad of cotton wool is used. The pad should be made of a convenient size, and to obtain a small amount of grease to hold the gold leaf the wool may be passed over the surface of the hair or the face. Another pad of wool should be kept at hand, on which is a trace of either vaseline, lard, or cocoanut oil. This pad is passed very lightly over the parts already glaired, in order to hold the gold leaf to the surface in readiness for tooling. In light or delicately coloured leather, the amount of grease so used must be the least possible. The method of picking up the gold with the wool and placing it upon the book is illustrated in Figs. 88 and 89. As the wool is placed in position a firm even pressure is given, and the gold leaf will be found to leave the wool, and become attached to the book by the aid of the trace of grease placed to receive it. All is now ready for tooling over the gold. The tools should again be placed on the stove and heated, and if it is found necessary to cool them the shank of the tool—not the face—must be placed on the cooling sponge. Each tool must be tested before using, so that the exact heat may be known. The whole of the letters, lines, and other decoration, which have been covered with gold leaf, are to be re-impressed with the heated tools ; and it is a test of the finisher's skill to place each tool exactly in the same impression over the gold that was made when the work was *blinded in*, and then to press the same down with a steady and even pressure. Much practice is required to do this accurately and well, and to prevent "doubling," *i.e.*, causing a double impression of the letters or lines. If the tools are used too hot, the gold leaf left in the impressions will be lacking in brilliancy; and on the other hand, if the tools are too cold, the gold leaf will probably show breaks in the lines or designs. This is no doubt due to the fact that the tool not being hot enough, portions of the gold leaf have not properly adhered to the leather ; hence it will be recognised how necessary it is to use the tools at exactly the right heat. Broken places in the gold impressions may be sometimes mended by breathing upon the defective

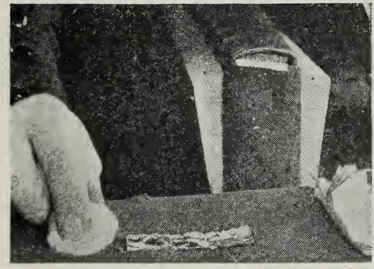


FIG. 88.

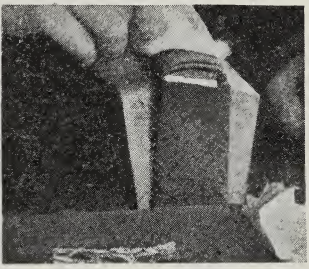


FIG. 89.

part, and immediately covering it with a new piece of gold leaf. Then with a slightly hotter tool, the impressions should be struck again. If this method should fail, re-glaire, and repeat the operation, taking care to profit by past experience, and to use the tool a trifle hotter, or colder, as the case may be. When all the design covered in with the gold leaf has been worked in, the surplus may be removed with specially prepared rubber. This prepared bottle-rubber is rubbed over the surface, and will remove all the superfluous gold. Probably after this rubbing some defects in the impressions that were not seen before will be revealed. If so, they must be repaired in the manner previously described. All traces of the grease used on the cover, for the purpose of holding the leaf in position during the tooling, must be removed. This can be done with a pad of cotton wool containing a little benzine.

The sides of the book are the last to be finished, and as the whole process is similar to the method adopted for the lettering and decoration of the back, it is unnecessary to repeat it. All straight lines, both on the outside and inside of the cover, are put in with the fillet. The method of holding this tool will be seen in Fig. 90; the small wheel revolves as the tool is pushed forward. For the lines which run on each side of the bands and panels on the back, a pallet is used.

BLIND TOOLING.—The preliminary process of "marking up" and working the design in blind is precisely the same as that described for gold tooling, the only difference being that the impressions are left plain—without any gold, and a polish only is given to them by the working of the tool. For lines this polish is obtained by the friction created when the tool is "jiggered," *i.e.*, worked up and down the impressions. Other tools are worked in with a slightly rocking movement until they obtain the desired colour and brilliancy. After the design has been first impressed, the leather should be well damped with a sponge and water. This moisture may be driven in by the aid of a brush, or a good plan is to tool the book while it is still damp from the covering. In order to obtain a good polish and a uniform colour, it may be necessary to damp the leather and to work the tools in several times, altering the degree of heat as may be required. Should the tools show a tendency to stick to the leather, rub a slightly greased piece of leather, kept for the purpose, over the face of the tool. A combination of gold and blind tooling is often very effective.

The final process is to paste down the end-papers. One of two methods must be adopted, viz., "pasting down open" or "pasting down shut." The former method is always used for leather bindings, and the latter may be used for cloth or linen covers.

PASTING DOWN OPEN.—The protecting end paper, called the waste sheet (No. 2, in Fig. 17) should first be torn out, and the joint be cleared of any particles of glue or paste. Should a leather or other joint have been put in, the board paper should be carefully cut and trimmed to fit into the panel (see Chapter VIII). The book is then placed down flat with one board open, and to keep it in this position pressing boards are put underneath. If there is no joint the end paper (No. 4 in Fig. 17) is carefully folded over the joint of the book, *i.e.*, over the junction of the board and the book, and down on to the board. The three edges of the end papers are then to be trimmed in order that the margins of the turnings of the leather may show equally all round. To do this, after the paper has been turned on to the board, make marks with the dividers on the end papers from the edges of the cover at head and tail, and from the fore-edge almost as far in as the depth of the margins of the leather. Then turn the paper back on to a tin, which has been placed on the book, and with a very sharp knife, and using a steel straightedge as a guide, cut through the marks made by the dividers, but leave at the back edges of head and tail a small piece of end paper, the depth of the joint—not cut. A coating of moderately thin paste is given to the paper, after

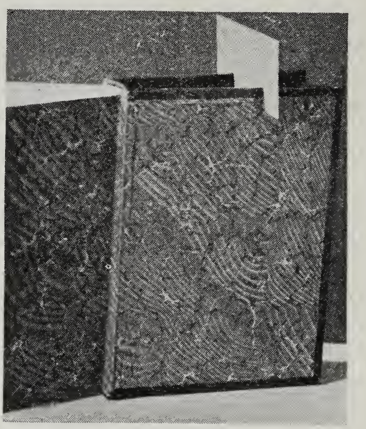


Fig. 91.

which it is folded over into its place, and well rubbed down, especially in the joint. This latter point is very

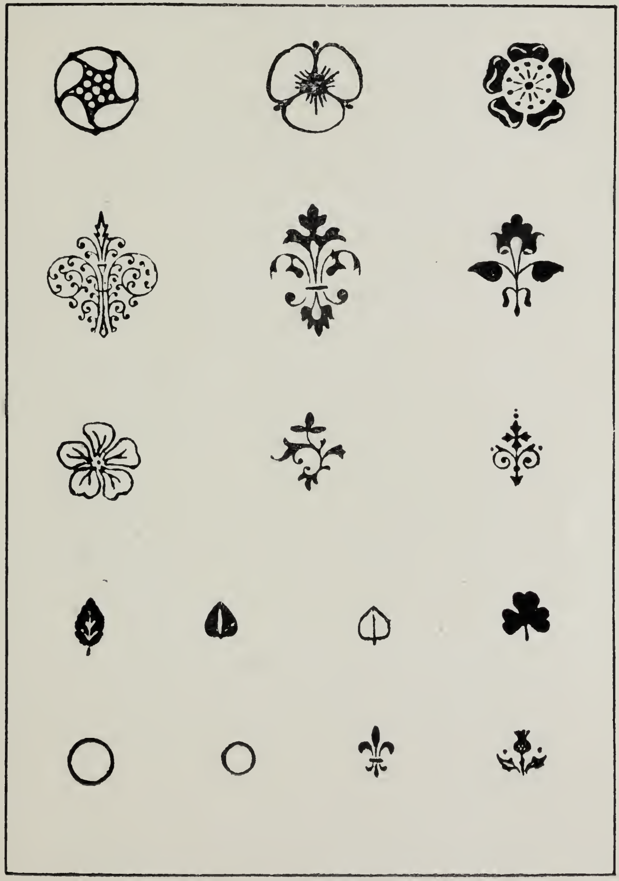


FIG. 92.

important, and considerable patience and care are required before the pupil attains the ability to form a good square joint. To ensure success, place a piece of clean paper over the joint, and by the aid of a folder and the thumb or finger, rub up and down the joint until the end paper thoroughly adheres. When rubbing down the end paper on to the board, use the folder over a piece of clean paper, and rub it across in different directions. When the one side has been pasted down, *the board must on no account be closed.* The book is turned over without disturbing it, and the other side is pasted down in the same way. Then the book is stood on end to dry, and a small clip of cardboard is used to keep the boards quite wide open (Fig. 91). When they are dry the boards may be carefully closed, and the book may be placed under a weight for some hours. Fig. 92 is included to show a few of the designs made by a collection of finishers' tools.

PASTING DOWN SHEET.—The waste sheets are torn out, and the joint is cleared in the way previously described; but in this method, instead of the pasted end papers being brought over on to the boards, the *boards* are shut on to the end papers, and must not be opened until the book has been nipped in the press. After nipping, open it to see that all is right, and then place it under a light weight until it is thoroughly dry.

# CHAPTER XI.

## MISCELLANEOUS.

GLAIRE.—Two kinds are required: glaire for edge gilding, and finishers' glaire. To prepare the former, mix in the proportions of the white of one egg to a cup of water; beat well until thoroughly mixed, and a thick froth will be formed. After standing for some time, the glaire may be poured off, leaving the froth behind. Finishers' glaire is prepared by adding a dessert-spoonful of pure vinegar to the white of one egg; this must be well beaten up, and stood aside for some hours. It is afterwards poured off, and is ready for use. Water may be used instead of vinegar.

PASTE.—This is one of the most important of the many materials required for bookbinding. To make suitable paste take ½ lb. of *best white flour* and ¼ oz. of powdered alum, and mix these two ingredients thoroughly together until both are incorporated. Put the mixture in a convenient vessel and gradually add cold water, stirring the matter at the same time with a *wooden* spoon, until the whole has about the same consistency as thick cream. The mixture must be worked about well until all lumps have been broken up and have disappeared. Into a saucepan put a pint of water; bring this almost up to boiling point, and then reduce the heat under the saucepan sufficiently to keep the temperature of the water still at the same degree of heat. Now gradually pour the prepared batter into the saucepan, stirring it quickly and briskly with the spoon as it is poured in. When it is thoroughly mixed it should be brought to boiling point, and then allowed to simmer from 15 to 20 minutes, being occasionally stirred to prevent burning. It will gradually thicken and may then be poured off and allowed to cool. After cooling, a skin will form upon the top, which should be removed. The paste is now to be well beaten up by means of a flat stick, and it will afterwards be ready for use, as "thick" paste. When "thin" paste is required, some of the "thick" paste is beaten up with cold water. A wooden box or an enamelled bowl is a suitable receptacle in which to keep paste. Across the top of either may be stretched a piece of string or galvanised wire, and this will be found very convenient in scraping away surplus paste from the paste brush. In selecting a suitable brush do not purchase one bound with iron wire, as the paste will corrode this, and the rust will be transferred to the materials on the book and will cause undesirable stains. Some binders add to their paste a few drops of turpentine, oil of cloves, or other spice oils, in order to increase the keeping qualities, and also to preserve the finished books from attacks of mice or insects. For very white paste, which may be required in mending leaves, etc., substitute for ordinary flour, starch, corn, or rice flour. Prepared paste can be bought at most dealers in bookbinders' materials. This paste will save the time and trouble of making.

Glue.—Many qualities of glue are sold, but only the best Scotch glue should be used, and it should be procured from a reputable dealer who will guarantee it to be of good quality. Probably few homes are without a glue pot, but a temporary one may be made by using an ordinary jam-jar. In this is placed the broken-up glue covered with water, and it is then stood in a saucepan of water. In preparing a fresh pot of glue, first remove all the burnt and old glue from the sides of the pot, and wash out well both inner and outer receptacles. The cakes of glue should then be broken up into small pieces, placed in the inner pot, covered with water, and allowed to stand for some hours. After standing, if the glue is good it will swell considerably, and become like soft jelly. The glue-pot may then be put on to boil until the glue is quite hot, when it is ready for use. It should be frequently stirred during the first heating, and for this purpose a flat stick is better than the brush. It should be remembered that continued re-heatings of the glue reduce its adhesive properties, and that if the glue be allowed to burn, through neglecting to keep the outer pot replenished with water, it becomes useless. For special work, where a dark coloured glue would be unsuitable, sheet gelatine or pale French glue may be added in the proportions of 1 to 1.

Torn Leaves.—The binder is frequently called upon to mend these as carefully and neatly as possible. The torn parts should first be brought together in order to ascertain that they will meet and fit accurately when mended. Then any irregularities should be smoothed out, so that both parts of the leaf will lie quite flat, and the torn edges should be pasted. In doing this the finger is the best instrument for putting on the paste. Next very accurately fit the pieces together, and be careful to prevent the paste from touching any other portion of the leaf except where it has been torn. A strip of Japanese tissue paper long enough and wide enough to cover the tear is placed on each side, and a weight is put on top until the leaf is thoroughly dry. Do not rub the tissue paper down to the leaf, but merely place it in position. When dry the tissue paper should be torn off, and some of the fibres of this paper will be found to adhere to each side of the torn leaf, and thus will serve to hold the torn edges together.

WASHING AND CLEANING.—Books, old, dirty, and stained, often come into a binder's hands, and it will be found that these can be considerably improved by judicious washing and cleaning. Assuming that the book to be treated is a dirty one, it will be necessary to carefully pull it to pieces by first cutting the old sewing thread. The leaves forming the sections should then be separated and placed out flat upon a level surface. The first efforts at cleaning should be made by using a piece of stale bread—of course, without any grease upon it—to rub over the surface of the dirty leaf. The safest way of rubbing will be found in a rotary motion, and the crumbs may be well rubbed over the leaf by the aid of the open palm of the hand. Most of the dust and dirt will give way to this treatment. For any spots, other than grease marks or stains, which will not yield to the above method, a piece of *soft* indiarubber should be tried, or very fine glass-paper. But it is well for the beginner to bear in mind the fact that there is much less possibility of damaging the leaf with bread crumbs than with indiarubber or glass-paper.

STAINS.—Many stains can be washed out with plain warm water; or, for stains which fail to respond to this, a little powdered alum may be added to the water. The leaf to be washed should be placed in a flat dish and covered with the water or solution; the stain may then be carefully brushed over with a camel's-hair brush, or the whole leaf may thus be brushed over. It is then removed, and after being thoroughly rinsed, is hung upon the line to dry.

GREASE MARKS.—For these a little white soap should be tried. Brush the soap over the grease spot, and allow it to remain upon the greasy place for half an hour, and then wash it off. Many such marks give way to this remedy; but if stronger treatment is necessary, benzine or ether may be applied. Pieces of blotting-paper are afterwards placed on each side of the leaf, and a fairly warm iron is rubbed over the blotting-paper, when the latter will be found to absorb the grease.

When the leaves have to be cleaned with liquid of any kind, they should always be well rinsed before drying. After washing, or if the book is an old one, it will be *necessary* to re-size the leaves in order to strengthen them and produce a good surface again.

Sizing.—A porcelain dish, somewhat larger than the leaf, should be provided—enamelled iron dishes or those used by photographers answer the purpose very well. Into such a dish the size is placed. This is prepared from isinglass, gelatine, or boiled vellum chips. The two former materials should be dissolved in hot water, in the proportion of 1 ounce of either to 1 pint of water; and this should be kept in the fluid state by continual re-heating, or by being put over a small jet of gas during use. The leaves are dipped in separately for a few seconds, then taken out, and placed in a pile, with sheets of blotting-paper on the top and underneath. The whole is then nipped in the press, in order to squeeze out the superfluous size, and the leaves must be separated without delay, as the size quickly sets and causes them to stick together. They are afterwards hung up to dry, and when dry the book may be pressed, and is then ready for sewing and binding. Many stains will give way to the process of re-sizing only.

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